PCI Expansion Unit

for Fujitsu M10/SPARC M10 Systems
Service Manual

FUJITSU

ORACLE

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Preface

This document describes the maintenance procedure for the PCI expansion unit for Oracle or Fujitsu M10/SPARC M10 Systems. The maintenance work should be performed by service engineers and/or field engineers.

Fujitsu M10 is sold as SPARC M10 Systems by Fujitsu in Japan.
Fujitsu M10 and SPARC M10 Systems are identical products.

The preface includes the following sections:

- Audience
- Related Documentation
- Text Conventions
- Notes on Safety
- Syntax of the Command-Line Interface (CLI)
- Document Feedback

Audience

This document is intended for service engineers and field engineers who perform maintenance work on the system.

Related Documentation

All documents for your server are available online at the following locations.

- Sun Oracle software-related documents (Oracle Solaris, etc.)
  http://www.oracle.com/documentation/
- Fujitsu documents
  Japanese site

  http://jp.fujitsu.com/platform/server/sparc/manual/

  Global site

  http://www.fujitsu.com/global/services/computing/server/sparc/downloads/manual/

The following table lists documents related to SPARC M10 Systems.

SPARC M10 Systems related documentation (*1)
Fujitsu M10/SPARC M10 Systems Getting Started Guide (*2)
Fujitsu M10/SPARC M10 Systems Quick Guide
Fujitsu M10/SPARC M10 Systems Important Legal and Safety Information (*2)
Software License Conditions for Fujitsu M10/SPARC M10 Systems
Fujitsu M10/SPARC M10 Systems Safety and Compliance Guide
Fujitsu M10/SPARC M10 Systems Security Guide
Fujitsu M10/SPARC M10 Systems/SPARC Enterprise/PRIMEQUEST Common Installation Planning Manual
Fujitsu M10/SPARC M10 Systems Installation Guide
Fujitsu M10-1/SPARC M10-1 Service Manual
Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual
Crossbar Box for Fujitsu M10/SPARC M10 Systems Service Manual
PCI Expansion Unit for Fujitsu M10/SPARC M10 Systems Service Manual
Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide
Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide
Fujitsu M10/SPARC M10 Systems Domain Configuration Guide
Fujitsu M10/SPARC M10 Systems XSCF Reference Manual
Fujitsu M10/SPARC M10 Systems RCIL User Guide (*3)
Fujitsu M10/SPARC M10 Systems XSCF MIB and Trap Lists
Fujitsu M10/SPARC M10 Systems Product Notes
Fujitsu M10/SPARC M10 Systems Glossary

*1 The listed manuals are subject to change without notice.
*2 The printed manual comes with the product.
*3 This document applies specifically to the FUJITSU M10 and FUJITSU ETERNUS storage system.

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

Font/Symbol	Meaning	Example
AaBbCc123	What you type, when contrasted with on-screen computer output. This font represents the example of command input in the frame.	XSCF> **adduser jsmith**
AaBbCc123	The names of commands, files, and directories; on-screen computer output. This font represents the example of command output.	XSCF> **showuser -P** User Name: jsmith Privileges: useradm auditadm
Italic	Indicates the name of a reference manual, a variable, or user-replaceable text.	See the *Fujitsu M10/SPARC M10 Systems Installation Guide*.
" "	Indicates names of chapters, sections, items, buttons, or menus.	See "Chapter 2 Network Connection."

Command syntax in the text

While the XSCF commands have a section number of (8) or (1), it is omitted from the text.
The Oracle Solaris commands have a section number such as (1M) in the text.
Each command has a section number in a command name to prompt users to refer to it.

Notes on Safety

Read the following documents thoroughly before using or handling any SPARC M10 Systems.

- *SPARC M10 Systems Important Legal and Safety Information*
- *SPARC M10 Systems Safety and Compliance Guide*

Syntax of the Command-Line Interface (CLI)

The command syntax is as follows:

- A variable that requires the input of a value must be put in Italics.
- An optional element must be enclosed in [].
- A group of options for an optional keyword must be enclosed in [] and delimited by |.

Document Feedback

If you have any comments or requests regarding this document, please take a moment to share it with us by indicating the manual code, manual title, and page, and stating your points specifically through the following websites:

- Japanese site
  http://jp.fujitsu.com/platform/server/sparc/manual/
- Global site
  http://www.fujitsu.com/global/services/computing/server/sparc/downloads/manual/

Chapter 1

Before Starting Maintenance Work

This chapter describes the safety precautions that must be observed before starting any maintenance work, and provides important information that you should know. Note the meanings of each of the following symbols and labels to ensure that the work is done correctly.

- Warning/Caution Indications
- Labels/Tags
- Safety Precautions
- Notes Regarding Static Electricity
- Other Precautions
- Emergency Power Off
- Important Information about the XCP Firmware

1.1 Warning/Caution Indications

This manual uses the following conventions to indicate warning and alert messages, which are intended to prevent injury to the user and others as well as damage to property.

Warning - "WARNING" indicates a potential hazard that could result in death or serious personal injury if the user does not perform the procedure correctly.

Caution - "CAUTION" indicates a potential hazard that could result in minor or moderate personal injury if the user does not perform the procedure correctly. This also indicates that damage to the unit or other property may occur if the user does not perform the procedure correctly.

1.2 Labels/Tags

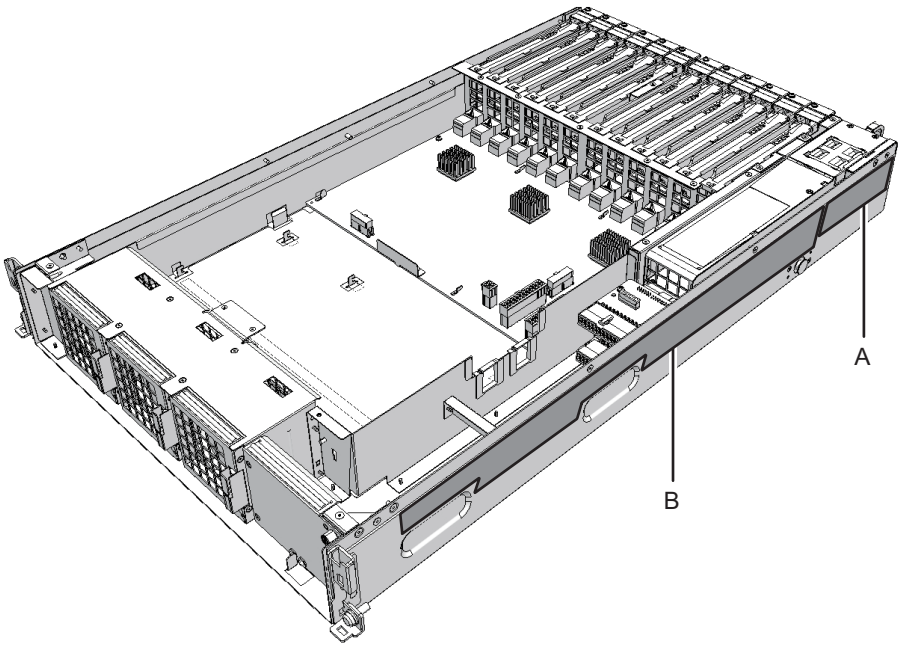
This section describes the labels and tags attached to the chassis.
When performing maintenance, always observe the precautions on the standard labels attached to the chassis.

Caution - Do not remove the labels or tags.

Note - The contents of the labels and tags described here may differ from those actually attached to the chassis.

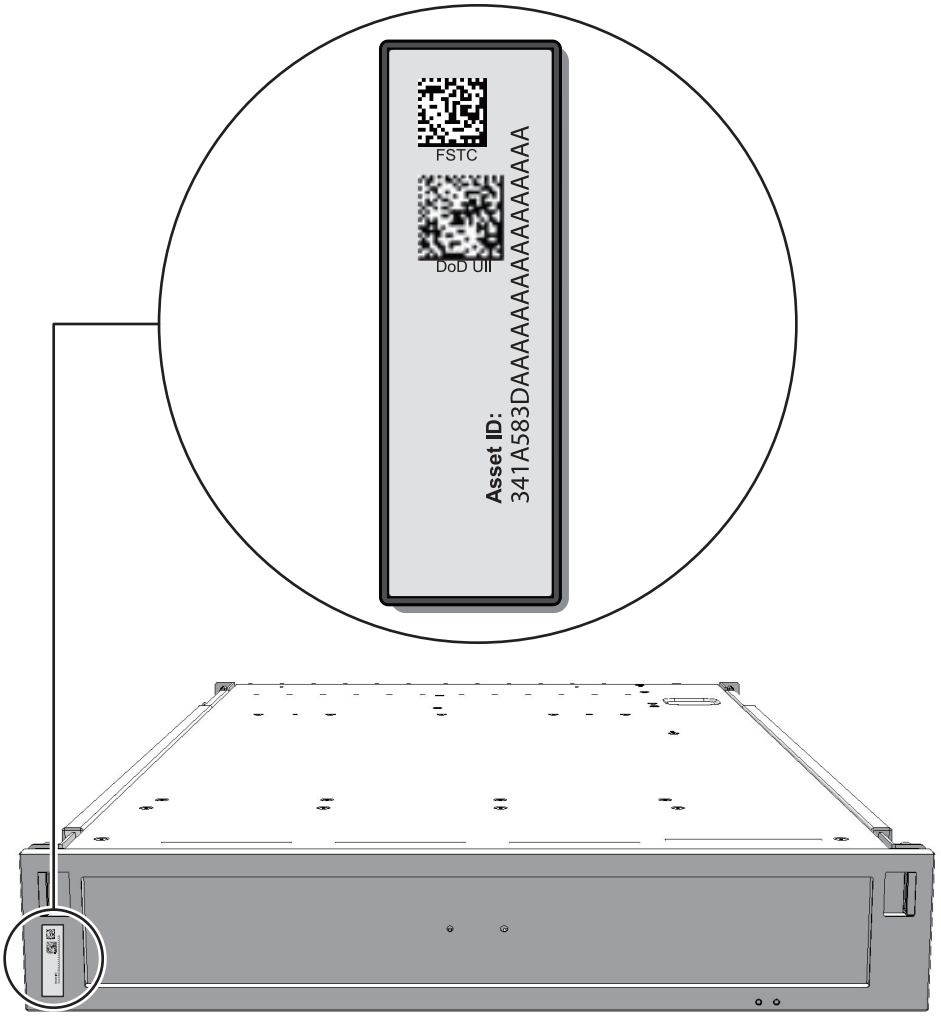
- The system nameplate label (A in the figure) provides the product model number, serial number, and version number required for maintenance and management.
- The standard label (B in the figure) contains notes and the following approved standards.
  - Security: NRTL/C
  - Electromagnetic wave: VCCI-A, FCC-A, DOC-A, KCC, and C-Tick
  - Security and electromagnetic wave: CE and GOST-R

Figure 1-1 Positions of system nameplate label/standard label



- The RFID tag contains the Asset ID. The RFID tag is attached to the front cover of the chassis.

Figure 1-2 RFID tag



1.3 Safety Precautions

Observe the following precautions to protect yourself when performing maintenance.

- Observe all the precautions, warnings, and instructions described on the chassis.
- Do not insert foreign objects into the openings in the chassis. Any such foreign object could come into contact with high-voltage circuitry or could short circuit

the components, causing a fire or an electric shock.

- Contact a service engineer and request inspection of the chassis.

Safety precautions on electricity

- Confirm that the voltage and frequency of your input power supply match those shown on the electric rating label affixed on the chassis.
- Wear a wrist strap when handling the I/O board, PCI tray, or other print boards.
- Use a grounded power outlet.
- Do not make any mechanical or electrical alterations. We do not take any responsibility for issues arising from non-authorized modifications to the chassis.

1.4 Notes Regarding Static Electricity

Observe the precautions concerning the electrostatic discharge (ESD) as described in Table 1-1 to ensure the safety of personnel and the system.

Table 1-1 ESD precautions

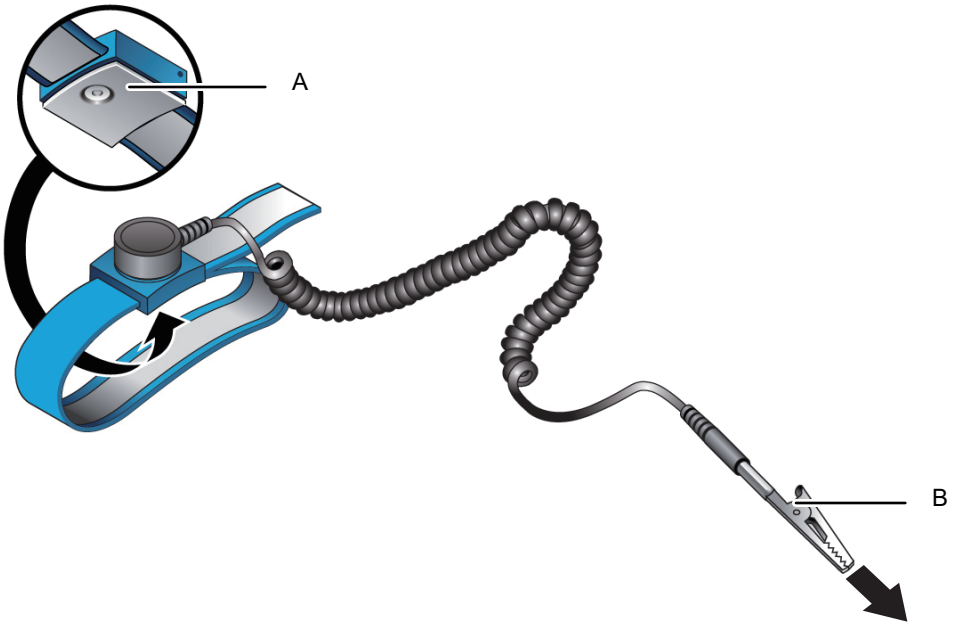
Item	Note
Wrist strap	Wear an antistatic wrist strap when handling printed boards.
ESD mat	An approved ESD mat provides protection from static damage when used together with a wrist strap. The mat also acts as a cushion to protect the small parts that are attached to printed boards.
Antistatic bag/ ESD safe packaging box	After removing a printed board or component, place it in the antistatic bag or ESD safe packaging box.

Using a wrist strap

Wear a wrist strap in such a way that the inner metal surface (A in the figure) of the wrist strap band is in contact with your skin. Connect the clip (B in the figure) directly to the chassis.

Caution - Do not connect the wrist strap clip to the ESD mat. By connecting the wrist strap clip to the chassis, the operator and components assume the same electrical potential, thus eliminating the danger of damage from static discharge.

Figure 1-3 Wrist strap connection destination



1.5 Other Precautions

- The printed boards of the PCI expansion unit are susceptible to static damage. To prevent damage to the printed boards, therefore, wear a wrist strap and ground it to the chassis prior to starting maintenance.
- When mounting a component in the chassis, confirm that the connectors on the chassis and components do not have any bent pins and that the pins are aligned. If you attempt to mount a component while any of the connectors have bent pins, the chassis or component may be damaged. When mounting a component, perform the work carefully so as not to bend any pins.
- If you cannot reach the latch lock of the connector when removing the management cable or other cables, depress the latch with the tip of a flat-bladed screwdriver and then remove the cable. If you attempt to remove the cable forcibly, the link board and/or the PCI Express (PCIe) card may be damaged.
- Do not use a power cord other than the specified type.

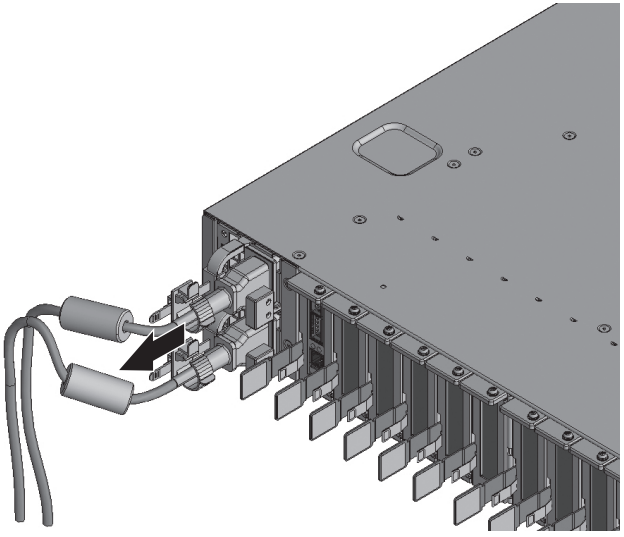
1.6 Emergency Power Off

This section explains the procedure for powering off the system in the case of an emergency.

Caution - Immediately shut down the product in the event of an emergency (for example, when the chassis emits smoke or flame) and then disconnect the input power. Prevention of fire must always be your highest priority, regardless of the task that you are currently performing.

1. **Remove all the power cords from the power supply unit installed at the rear of the chassis.**

Figure 1-4 Removing power cords



1.7 Important Information about the XCP Firmware

This section describes important information that you should know about the XCP firmware version and when connecting the PCI expansion unit.

1.7.1 Precautions for updating the XCP firmware

- [SPARC M10-1]
  The logical domain configuration of the physical partition will return to the factory default at the next startup when any of the following conditions are met: If the logical domain configuration contains a guest domain, the OpenBoot PROM environment variable of the control domain will also be initialized.
  - When an update is performed from firmware version XCP2043 or earlier to firmware version XCP2044 or later in a configuration with a PCI expansion unit connected
  - When a PCI expansion unit is installed or removed from a system with a firmware version that is XCP2044 or later

  Save the logical domain configuration information from Oracle Solaris to XML in advance. To save it to XML, execute the ldm list-constraints -x command, and to restore it from XML, execute the ldm init-system -i command. Also, save the setting information for the OpenBoot PROM environment variable of the control domain to the notepad, and then reset it. To display it, execute the printenv command while the ok prompt is displayed. For details on these procedures, see "1.7.3 How to save/restore the logical domain configuration information and the OpenBoot PROM environment variable."

  The processes to be performed when it is necessary to save/restore each item of information related to the PCI expansion unit configuration are as follows.

Table 1-2 Necessary processes related to the PCI expansion unit configuration

PCI expansion unit installation	Domain configuration	Reconfiguration of Oracle VM Server for SPARC config	Resetting of OpenBoot PROM environment variable
Unsupported	factory-default	Unnecessary	Unnecessary
Unsupported	Contains a guest domain	Unnecessary	Unnecessary
Supported	factory-default	Unnecessary	Unnecessary
Supported	Contains a guest domain	Necessary (XML)	Necessary

1.7.2 Notes on using the direct I/O function

- [SPARC M10-4/M10-4S]
  If the firmware version XCP2044 or later is used on the SPARC M10-4 or a firmware version XCP2050 or later is used on the SPARC M10-4S and one of the following operations is performed with the setpciboxdio command, the logical domain configuration of the physical partition will return to the factory default at the next startup. If the domain configuration contains a guest domain, the OpenBoot PROM environment variable of the control domain will also be initialized.
  - Changing the enable/disable setting for the direct I/O function of the PCI

expansion unit

- Installing/removing/replacing the PCI expansion unit for the PCIe slot of the SPARC M10 chassis for which the direct I/O function of the PCI expansion unit is enabled

Save the logical domain configuration information from Oracle Solaris to XML in advance. To save it to XML, execute the ldm list-constraints -x command, and to restore it from XML, execute the ldm init-system -i command. Also, save the setting information for the OpenBoot PROM environment variable of the control domain to the notepad, and then reset it. To display it, execute the printenv command while the ok prompt is displayed. For details on these procedures, see "1.7.3 How to save/restore the logical domain configuration information and the OpenBoot PROM environment variable."

When executing the setpciboxdio command to change the enable/disable setting for the direct I/O function of the PCI expansion unit, the following operations must be performed to save/restore each item of information.

Table 1-3 Operations to change the enable/disable setting with the setpciboxdio command

PCI expansion unit configuration	Domain configuration	Reconfiguration of Oracle VM Server for SPARC config	Resetting of OpenBoot PROM environment variable
Existence/non-existence	factory-default	Unnecessary	Necessary
Existence/non-existence	Contains a guest domain	Necessary (XML)	Necessary

Suppose that the setpciboxdio command is executed to install, remove, or replace the PCI expansion unit for the PCIe slot of the SPARC M10 chassis for which the direct I/O function of the PCI expansion unit is enabled. The following operations must be performed to save/restore each item of information:

Note - If you use the PCI Hot Plug (PHP) function to perform maintenance on the PCI expansion unit, the direct I/O function is disabled. Therefore, it is not necessary to save/restore each item of information.

Table 1-4 Operations when installing/removing/replacing the PCI expansion unit for the PCIe slot of the SPARC M10 chassis for which the direct I/O function is enabled

Maintenance environment	Domain configuration	Reconfiguration of Oracle VM Server for SPARC config	Resetting of OpenBoot PROM environment variable
When stopping PPAR for installation/removal	factory-default Contains a guest domain	Unnecessary Necessary (XML)	Unnecessary Necessary
When stopping PPAR to replace the failed PCI expansion unit (*1)	factory-default Contains a guest domain	Unnecessary Necessary (XML)	Unnecessary Necessary
When stopping PPAR to replace the normal PCI expansion unit (*1)	factory-default Contains a guest domain	Unnecessary Unnecessary	Unnecessary Unnecessary

*1 This includes the replacement of the link card, link cable, management cable or link board.

1.7.3 How to save/restore the logical domain configuration information and the OpenBoot PROM environment variable

1. **Execute the ldm ls-spconfig command on Oracle Solaris super-user prompt to display the list of the configuration information, and then confirm the configuration information to be saved.**
   The following example shows that test3 is the current configuration information.

```
# ldm ls-spconfig
factory-default
test1
test2
test3 [current]
```

   If the current configuration is shown as "next poweron," execute the ldm add-spconfig command to save the current configuration information. This is because the configuration information stored in the XSCF is different from that stored in the control domain.

   In the following example, the current configuration information is saved in test4 because test3 is "next poweron."

```
# ldm ls-spconfig
factory-default
test1
test2
test3 [next poweron]
# ldm add-spconfig test4
```

```
# ldm ls-spconfig
factory-default
test1
test2
test3
test4 [current]
```

2. **Execute the ldm set-spconfig command to specify the configuration information to be set.**
   The following example specifies test1.

```
# ldm set-spconfig test1
# ldm ls-spconfig
factory-default
test1 [next poweron]
test2
test3
```

3. **Execute the poweroff and poweron commands of the XSCF firmware to turn off/on the power to the physical partition.**
   Before turning off the power to the system, stop the logical domain with an appropriate procedure and use the ldm unbind command to transfer it to the inactive state.

   The following example shows that the power to PPAR 0 is turned off/on.

```
XSCF> poweroff -p 0
XSCF> poweron -p 0
```

4. **Execute the ldm ls-spconfig command to confirm that the configuration information is set as specified.**
   The following example shows that test1 is set as the current configuration information.

```
# ldm ls-spconfig
factory-default
test1 [current]
test2
test3
```

5. **Execute the ldm ls-constraints -x command to save the current configuration information.**
   If necessary, backup XML.

   In the following example, the current configuration information is saved in test1.xml.

```
# ldm ls-constraints -x > /var/tmp/test1.xml
```

6. **Execute the more command to confirm that the configuration information is correct.**

```
# more /var/tmp/test1.xml
<?xml version="1.0"?>
<LDM_interface version="1.3" xmlns:xsi=http://www.w3.org/2001/
XMLSchema-instancce
```

7. **If there are multiple pieces of configuration information to be saved, save all of them.**
   Repeat from step 2 to step 6 to save the configuration information.
8. **Execute the ldm set-spconfig factory-default command to set the system to the factory default.**

```
# ldm set-spconfig factory-default
# ldm ls-spconfig
factory-default [next poweron]
test1 [current]
test2
test3
```

9. **Execute the ldm rm-spconfig command to delete all the configuration information.**

```
# ldm rm-spconfig test1
# ldm rm-spconfig test2
# ldm rm-spconfig test3
# ldm ls-config
factory-default [next poweron]
```

10. **Stop the logical domain to set it to the OpenBoot PROM state.**
    Before turning off the power to the system, stop the logical domain with an appropriate procedure and use the ldm unbind command to transfer it to the inactive state.

```
# shutdown -i0 -g0 -y
```

11. **Check the OpenBoot PROM environment variable with the printenv command.**

```
{0} ok printenv
Variable Name           Value                          Default Value
ttya-rts-dtr-off        false                          false
ttya-ignore-cd          true                           true
keyboard-layout
reboot-command
security-mode           none                           No default
security-password                                      No default
```

```
security-#badlogins     0                              No default
diag-switch?            false                          false
local-mac-address?      true                           true
fcode-debug?            false                          false
scsi-initiator-id       7                              7
oem-logo                                               No default
oem-logo?               false                          false
oem-banner                                             No default
oem-banner?             false                          false
ansi-terminal?          true                           true
screen-#columns         80                             80
screen-#rows            34                             34
ttya-mode               9600,8,n,1,-                   9600,8,n,1,-
output-device           virtual-console                virtual-console
input-device            virtual-console                virtual-console
auto-boot-on-error?     false                          false
load-base               16384                          16384
auto-boot?              false                          true
network-boot-arguments
boot-command            boot                           boot
boot-file
boot-device             /pci@8000/pci@4/pci@0/pc ...   disk net
multipath-boot?         false                          false
boot-device-index       0                              0
use-nvramrc?            false                          false
nvramrc
error-reset-recovery    boot                           boot
```

If there is any omitted section with "...," review this section.

```
{0} ok printenv boot-device
boot-device =           /pci@8000/pci@4/pci@0/pci@0/scsi@0/disk@p0,0
```

12. **Execute the poweroff command of the XSCF firmware to turn off the power to the physical partition.**

```
XSCF> poweroff -p 0
```

13. **In accordance with the model in use, restore the configuration information of the logical domain from the XML file.**
    - For the SPARC M10-1
      When updating from the firmware version XCP2043 or earlier to the firmware version XCP2044 or later in the system with the PCI expansion unit, restore the configuration information of the logical domain from the XML file in step 14 and later.
      For details on the firmware update, see the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.
    - For the SPARC M10-4/M10-4S
      When executing the setpciboxdio command to change the enable/disable setting for the direct I/O function of the PCI expansion unit, restore the

configuration information of the logical domain from the XML file in step 14 and later.
For details on the setpciboxdio command, see the *Fujitsu M10/SPARC M10 Systems XSCF Reference Manual*.

14. **Execute the showdomainconfig command of the XSCF firmware to confirm that the configuration information at the next startup of the physical partition is the factory default.**
The following example shows that the configuration information at the next startup is the factory default.

```
XSCF> showdomainconfig -p 0
PPAR-ID     :0
Booting config
(Current)  :factory-default
(Next)     :factory-default
----------------------------------------------------------
Index       :1
config_name :factory-default
domains     :1
date_created:-
```

The following example shows that the configuration information at the next startup is not the factory default. In this case, execute the setdomainconfig command to set the configuration information at the next startup of the physical partition to the factory default.

```
XSCF> showdomainconfig -p 0
PPAR-ID     :0
Booting config
(Current)  :test1
(Next)     :test2
:
XSCF> setdomainconfig -p 0 -i 1
XSCF> showdomainconfig -p 0
PPAR-ID     :0
Booting config
(Current)  :test1
(Next)     : factory-default
----------------------------------------------------------
Index       :1
config_name :factory-default
domains     :1
date_created:-
```

15. **Check auto-boot? of the OpenBoot PROM environment variable to stop in the OpenBoot PROM state.**
If the value is true, change it to false.

```
XSCF> setpparparam -p 0 -s bootscript "setenv auto-boot? false"
PPAR-ID of PPARs that will be affected:0
OpenBoot PROM variable bootscript will be changed.
Continue? [y|n] :y
```

If you changed the value, check the OpenBoot PROM environment variable.

```
XSCF> showpparparam -p 0
use-nvramrc         :-
security-mode       :-
bootscript          :
setenv auto-boot? false
```

16. **Execute the poweron command to restart the physical partition.**

```
XSCF> poweron -p 0
```

17. **Execute the showdomainstatus command to check the status of the control domain.**
    Confirm that the status of the control domain is displayed as "OpenBoot Running" indicating that it is in the OpenBoot PROM state.

```
XSCF> showdomainstatus -p 0
Logical Domain Name   Status
primary               OpenBoot Running
```

18. **Execute the console command to switch to the control domain console.**

```
XSCF> console -p 0 -y
Console contents may be logged.
Connect to PPAR-ID 0?[y|n] :y
```

19. **Based on the record in step 11, restore the OpenBoot PROM environment variable.**
    In the following example, auto-boot? is restored to true.

```
{0} ok setenv auto-boot? true
auto-boot? =            true
{0} ok printenv auto-boot?
auto-boot? =            true
```

20. **Boot Oracle Solaris.**

```
{0} ok boot
```

21. **With the Oracle Solaris super-user prompt, confirm that the system has**

started with the factory default.

```
# ldm ls-spconfig
factory-default [current]
```

22. **Execute the ldm init-system command and the shutdown command to restart the control domain.**

```
# ldm init-system -i /var/tmp/test1.xml
Initiating a delayed reconfiguration operation on the primary domain.
All configuration changes for other domains are disabled until the primary
domain reboots, at which time the new configuration for the primary domain
will also take effect.
# shutdown -y -g0 -i6
```

23. **After restarting the control domain, bind and start other logical domains.**
For logical domains with dependency, start them in the correct order.

    In the following example, both root-domain and guest-domain are bound and started.

```
# ldm bind root-domain
# ldm start-domain root-domain
# ldm bind guest-domain
# ldm start-domain guest-domain
```

    If the binding failed because an overlapping resource exists, delete the relevant resource from the logical domain.

    The following example shows that an overlapping resource has been deleted.

```
# ldm bind root-domain
No free matching I/O device for LDom root-domain, name PCIE1
# ldm start-reconf primary
# ldm rm-io PCIE1 primary
--------------------------------------------------------------------------------
Notice: The primary domain is in the process of a delayed reconfiguration.
Any changes made to the primary domain will only take effect after it reboots.
--------------------------------------------------------------------------------
```

    If you deleted a resource, restart the control domain.

```
# shutdown -i6 -g0 -y
```

    If you deleted a resource, restart the control domain and then bind and start other logical domains.

    For logical domains with dependency, start them in the correct order.

    In the following example, both root-domain and guest-domain are bound and

started.

```
# ldm bind root-domain
# ldm start-domain root-domain
# ldm bind guest-domain
# ldm start-domain guest-domain
```

24. **Execute the ldm ls command to confirm that the logical domain is operating normally.**

```
# ldm ls
NAME             STATE      FLAGS   CONS    VCPU  MEMORY   UTIL  UPTIME
primary          active     -n-cv-  UART    8     8G        66%  4m
root-domain      active     -t----  5000    8     4G        19%  29s
:
:
```

25. **After restoring the configuration information, execute the ldm add-spconfig command to save the configuration information to the XSCF.**
In the following example, the configuration information of test1 has been saved to the XSCF.

```
# ldm add-spconfig test1
# ldm ls-spconfig
factory-default
test1 [current]
```

26. **If there are multiple pieces of configuration information to be restored, restore all of them.**
Repeat from step 14 to step 25 to restore the configuration information.

Chapter 2

Understanding the PCI Expansion Unit Components

This chapter describes the components of the PCI expansion unit.
Before starting any maintenance work, check and understand the configuration of the components and the LED indications.

- Identifying the Names and Locations of Components
- Checking the Status with the LED

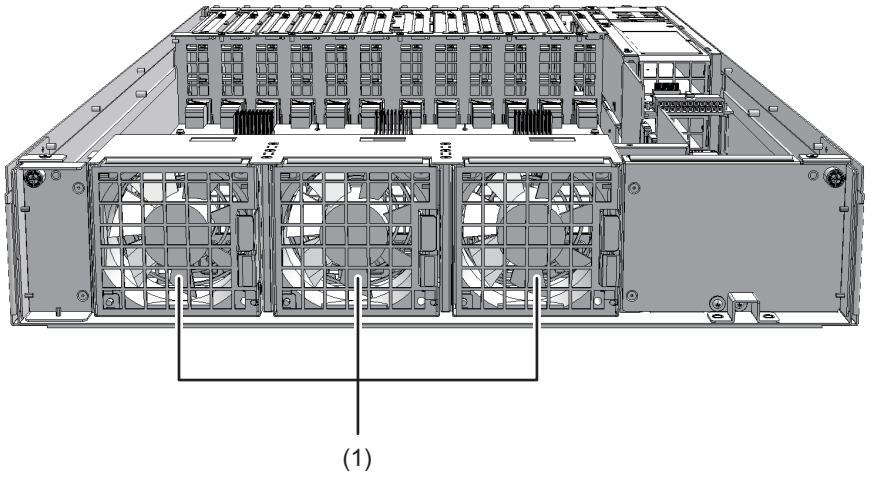
For the specifications of each component, see "Appendix B Component Specifications."

2.1 Identifying the Names and Locations of Components

This section describes the names and locations of each component.

Components that can be accessed from the front

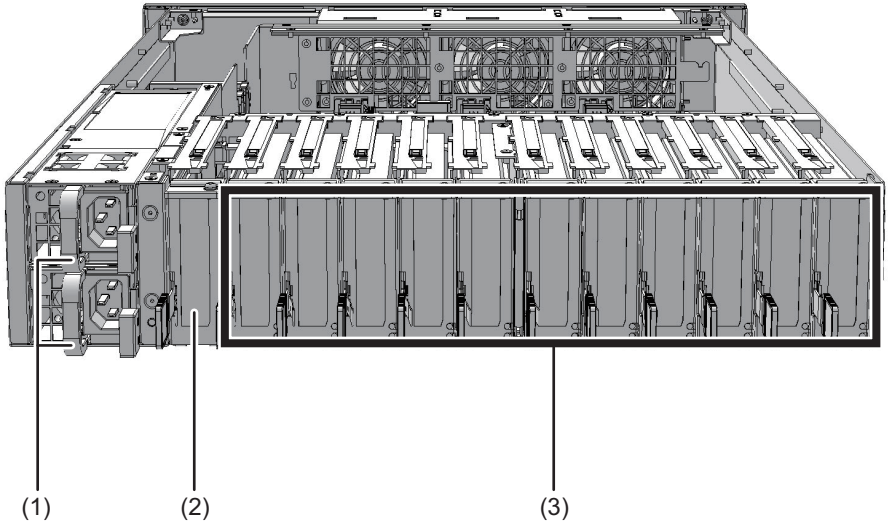
Figure 2-1 Location of components that can be accessed from the front



Location number	Component
1	Fan unit

Components that can be accessed from the rear

Figure 2-2 Location of components that can be accessed from the rear



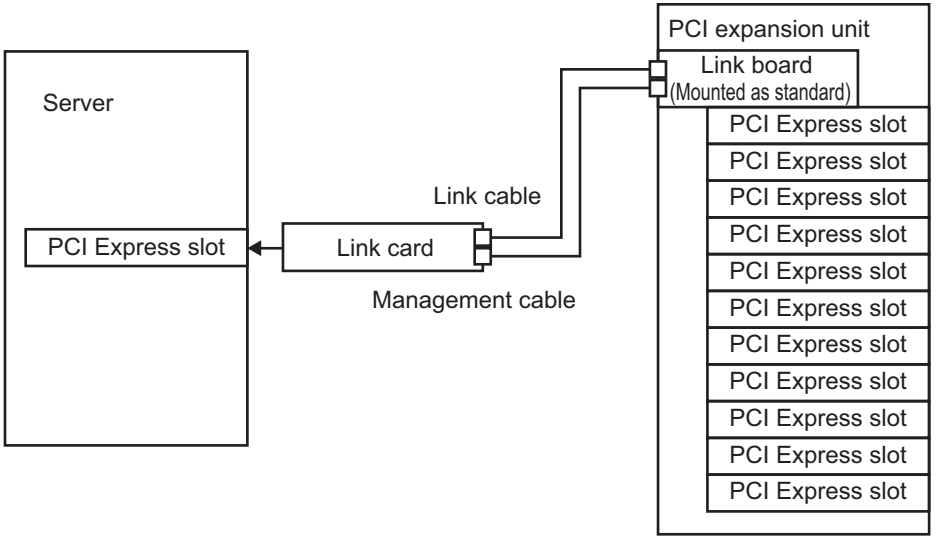
Location number	Component
1	Power supply unit
2	Link board (+1)
3	PCI Express (PCIe) card

*1 The link board can be mounted only in its dedicated slot.

- Connecting the link board to the link card

Connect the link board mounted in the PCI expansion unit to the link card mounted in the SPARC M10-1/M10-4/M10-4S with the link cables and the management cable. Figure 2-3 shows an example of the connection of the link board and the link card.

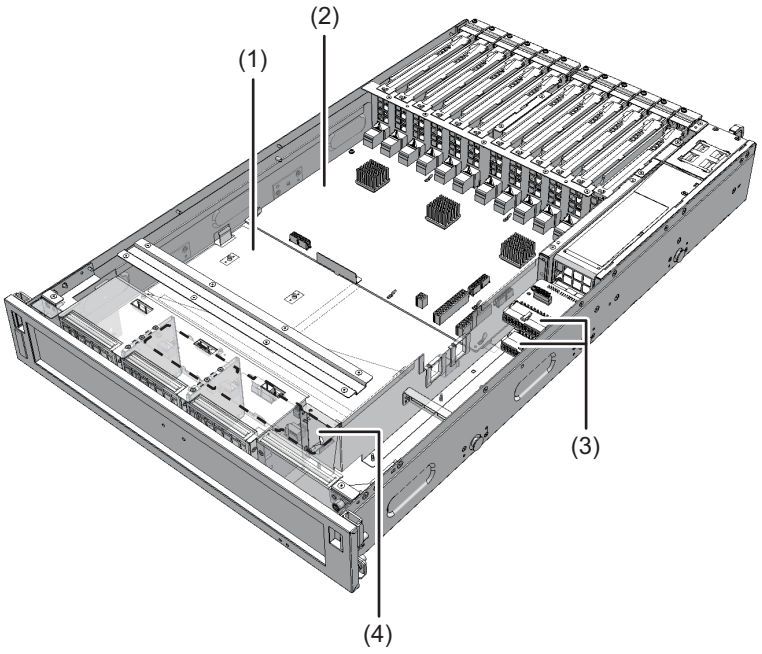
Figure 2-3 Example of connection



Internal components

Note - To access internal components, remove the PCI tray from the PCI expansion unit. For details on the procedure for removing the PCI tray, see "15.3 Removing the PCI Tray."

Figure 2-4 Locations of internal components



Location number	Component
1	PCI tray
2	I/O board
3	PSU backplane
4	Fan backplane

2.2 Checking the Status with the LED

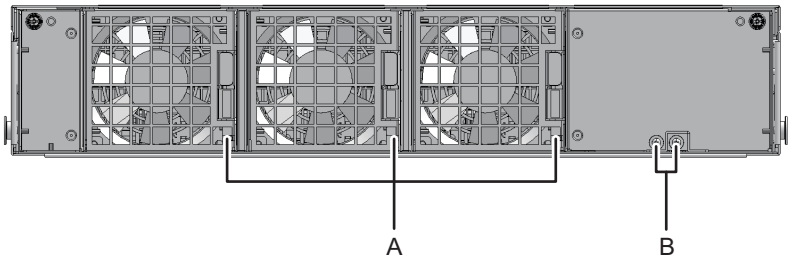
This section describes how to identify the state of each component from its LED indication.
LEDs are mounted on the front panel of the PCI expansion unit and on each component that can be maintained. If an error occurs, check the LEDs to see which component requires maintenance.

2.2.1 Front LEDs on the PCI expansion unit

The following LEDs are mounted on the front panel of the PCI expansion unit to indicate the status.

- Fan unit (A in the figure)
- PCI expansion unit (B in the figure)

Figure 2-5 LEDs on front of the chassis



The LEDs on each component and the statuses those LEDs indicate are listed below.

Table 2-1 LEDs and status of fan unit

Name	Color	Status	Description
CHECK ⚠	Amber	On	Indicates that an error has occurred.
		Blinking (*1)	Indicates that the component requires maintenance. (This function is also referred to as the "locator.")
		Off	Indicates the normal state. Or, the breaker is open or the power supply is otherwise off.

*1 The blink interval is 1 second (1 Hz).

Table 2-2 LEDs and status of PCI expansion unit

Name	Color	Status	Description
READY	Green	On	Indicates that the component is operating.
⏻		Blinking (*1)	Power is supplied, but the system is not running. During this time, all of the I/O boards will be in the standby state.
		Off	The system is stopped.
CHECK	Amber	On	Indicates that an error has occurred.
⚠		Blinking (*1)	Indicates that the PCI expansion unit chassis requires maintenance. (This function is also referred to as the "locator.")
		Off	Indicates the normal state. Or, the breaker is open or the power supply is otherwise off.

*1 The blink interval is 1 second (1 Hz).

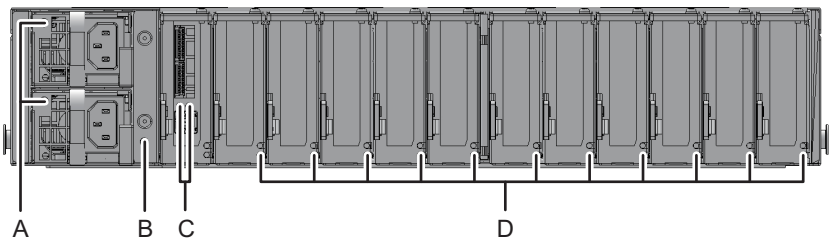
2.2.2 LEDs on rear of PCI expansion unit

An LED is mounted on each component. If a component experiences an error, check the LEDs to see which component requires maintenance. Check the LEDs before starting maintenance work.

The following LEDs are mounted on the rear panel of the PCI expansion unit.

- Power supply unit (A in the figure)
- I/O board (B in the figure)
- Link board (C in the figure)
- PCIe slot (D in the figure)

Figure 2-6 LEDs on the rear of the chassis



The LEDs mounted on each component and the statuses indicated by those LEDs are listed below.

Table 2-3 LEDs and status of power supply unit

Name	Color	Status	Description
POWER/FAIL	Green	On	The input power is turned on and power is being supplied normally.
☼ ⚠		Blinking (*1)	Standby condition.
	Amber	On	Indicates that an error has occurred.
		Blinking (*1)	Warning state (an error has occurred but the power unit is still operating).
		Off	The input power is turned off.

*1 The blink interval is 1 second (1 Hz).

Table 2-4 LEDs and status of I/O board

Name	Color	Status	Description
CHECK (Indicator)	Amber	On	Indicates that an error has occurred.
⚠		Blinking (*1)	Indicates that the component requires maintenance. (This function is also referred to as the "locator.")
		Off	Indicates the normal state. Or, the breaker is open or the power supply is otherwise off.

*1 The blink interval is 1 second (1 Hz).

Table 2-5 LEDs and status of link board

Name	Color	Status	Description
LINK STATUS (PCI-Ex) /left side	Green	On	The link is established with PCI-Express Gen3 x8.
		Blinking (*1)	The link is established with other than PCI-Express Gen3 x8 (degradation condition).
		Off	The link is down.
LINK STATUS (Management) /right side	Green	On	The management link is established.
		Blinking (*1)	The management link is disconnected.
		Off	Indicates that power is not being supplied.

*1 The blink interval is 1 second (1 Hz).

Table 2-6 LEDs and status of PCIe slot

Name	Color	Status	Description
POWER	Green	On	Indicates that power is being supplied.
		Off	Indicates that power is not being supplied.
ATTENTION	Amber	On	Indicates that an error has occurred.
		Blinking (*1)	Indicates that the component requires maintenance. (This function is also referred to as the "locator.")
		Off	Indicates the normal state.

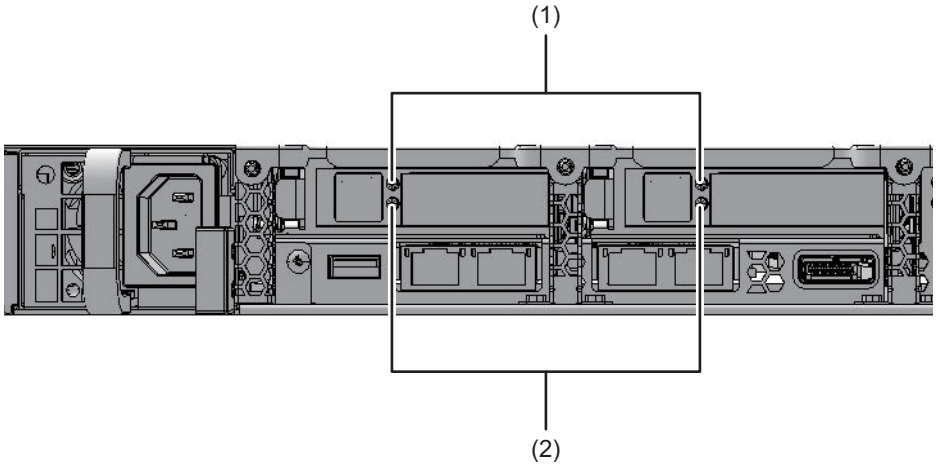
*1 The blink interval is 1 second (1 Hz).

2.2.3 LEDs on link card

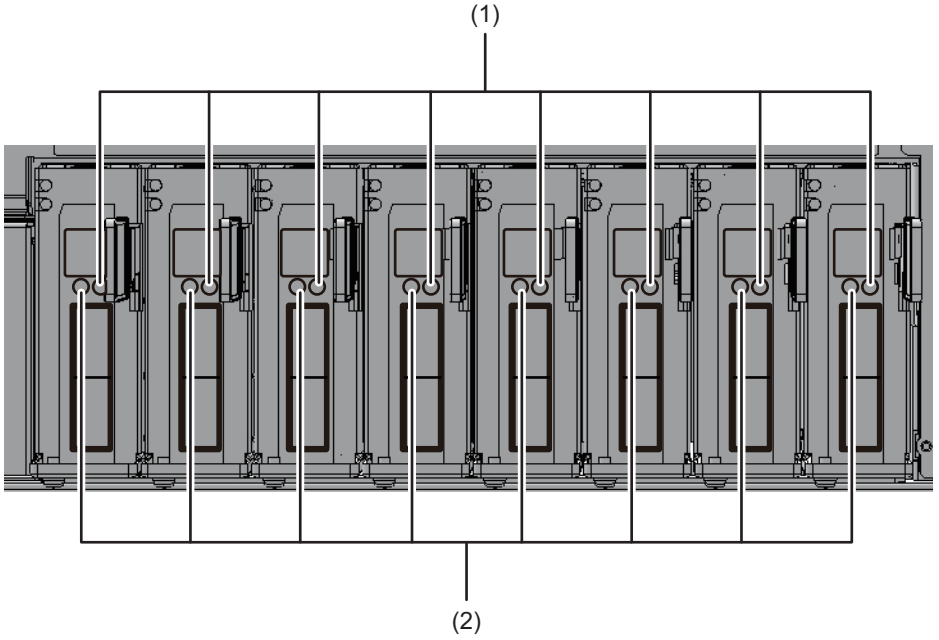
The link card is mounted in the PCIe slot of the server.

Figure 2-7 LEDs of link card

SPARC M10-1



SPARC M10-4/M10-4S



The LEDs on the link card and the statuses indicated by those LEDs are listed below.

Table 2-7 LEDs and status of link card

Location number	Name	Color	Status	Description
1	LINK STATUS (PCI-Ex)	Green	On	The link is established with PCI-Express Gen3 x8.
			Blinking (*1)	The link is established with other than PCI-Express Gen3 x8 (degradation condition).
			Off	The link is down.
2	LINK STATUS (Management)	Green	On	The management link is established.
			Blinking (*1)	The management link is disconnected.
			Off	Indicates that power is not being supplied.

*1 The blink interval is 1 second (1 Hz).

Chapter 3

Types of Maintenance

This chapter describes the maintenance types of the PCI expansion unit.

- Maintenance Types of the PCI Expansion Unit
- Types of Maintenance for the Link Card
- Maintenance Types of the PCIe Card

3.1 Maintenance Types of the PCI Expansion Unit

This section describes the maintenance types of the PCI expansion unit.
Maintenance of the PCI expansion unit is divided into two types depending on the input power status of the PCI expansion unit: hot maintenance and cold maintenance. The terms are defined as follows:

Hot maintenance

Maintenance can be performed with the power cord of the PCI expansion unit connected. Hot maintenance can be performed for the FRUs to be maintained by using the ioxadm or cfgadm command.

Cold maintenance

Maintenance is performed with the power cord of the PCI expansion unit disconnected. Cold maintenance can be performed for all the FRUs of the PCI expansion unit. Cold maintenance work varies depending on the method of releasing the link card mounted in the destination server.

- Releasing the link card after stopping the system
  This can be done when the connection destination of the PCI expansion unit is a SPARC M10-1/M10-4/M10-4S.

  Cold maintenance of the PCI expansion unit can be performed after stopping the system to which the PCI expansion unit is connected.

- Releasing the link card using PHP
  This can be done when the connection destination of the PCI expansion unit is a SPARC M10-4/M10-4S and the setting for the direct I/O function is disabled.

  Cold maintenance of the PCI expansion unit can be performed after releasing the link card mounted in the destination server from the system using the PCI hot plug (PHP).

- Releasing the link card using DR
  This can be done only when the connection destination of the PCI expansion unit has the building block configuration of the SPARC M10-4S.

  Cold maintenance of the PCI expansion unit can be performed after releasing the chassis in which the link card is mounted from the system using physical partition dynamic reconfiguration (DR).

Table 3-1 to Table 3-3 are lists of maintainable FRUs and maintenance types.

Table 3-1 When the connection destination of the PCI expansion unit is a SPARC M10-1

-: Not maintainable

FRU	Hot maintenance	Cold maintenance	Reference
PCI Express card (*1)	Enabled (*2)	Enabled	Chapter 8
Link board	-	Enabled	Chapter 9
Link cable	-	Enabled	Chapter 11
Management cable	-	Enabled	Chapter 12
Power supply unit	Enabled (*3)	Enabled	Chapter 13
Fan unit	Enabled	Enabled	Chapter 14
PCI tray	-	Enabled	Chapter 15
I/O board	-	Enabled	Chapter 16
Fan backplane	-	Enabled	Chapter 17

*1 The maintenance types of the PCIe card vary depending on the status of the PCIe card requiring maintenance. For details, see Table 3-5.
*2 Maintenance work is performed using PCI hot plug (PHP).
*3 This is supported only for a redundant configuration.

Table 3-2 When the connection destination of the PCI expansion unit is a SPARC M10-4/M10-4S (in a single-unit configuration)

-: Not maintainable

FRU	Hot maintenance	Cold maintenance	Reference
PCI Express card (*1)	Enabled (*2)	Enabled	Chapter 8
Link board	Enabled (*3)	Enabled	Chapter 9
Link cable	Enabled (*3)	Enabled	Chapter 11
Management cable	Enabled (*3)	Enabled	Chapter 12
Power supply unit	Enabled (*4)	Enabled	Chapter 13
Fan unit	Enabled	Enabled	Chapter 14

Table 3-2 When the connection destination of the PCI expansion unit is a SPARC M10-4/M10-4S (in a single-unit configuration) *(continued)*

-: Not maintainable

FRU	Hot maintenance	Cold maintenance	Reference
PCI tray	-	Enabled	Chapter 15
I/O board	-	Enabled	Chapter 16
Fan backplane	-	Enabled	Chapter 17

*1 The maintenance types of the PCIe card vary depending on the status of the PCIe card requiring maintenance. For details, see Table 3-5.
*2 Maintenance work is performed using PCI hot plug (PHP). Combined with dynamic SR-IOV or the dynamic reconfiguration function for PCIe end point devices, it also enables active maintenance of a PCIe card assigned as the SR-IOV virtual function or PCIe end point, to an I/O domain.
*3 It is necessary to use the PCI Hot Plug (PHP) to release the link card mounted on a destination server from the system. If the setting for the direct I/O function is enabled, then maintenance must be performed with the system powered off because the link card cannot use PHP.
*4 This is supported only for a redundant configuration.

Table 3-3 When the connection destination of the PCI expansion unit is a SPARC M10-4S (in a building block configuration)

-: Not maintainable

FRU	Hot maintenance	Cold maintenance	Reference
PCI Express card (*1)	Enabled (*2)	Enabled	Chapter 8
Link board	Enabled (*3)	Enabled	Chapter 9
Link cable	Enabled (*3)	Enabled	Chapter 11
Management cable	Enabled (*3)	Enabled	Chapter 12
Power supply unit	Enabled (*4)	Enabled	Chapter 13
Fan unit	Enabled	Enabled	Chapter 14
PCI tray	-	Enabled	Chapter 15
I/O board	-	Enabled	Chapter 16
Fan backplane	-	Enabled	Chapter 17

*1 The maintenance types of the PCIe card vary depending on the status of the PCIe card requiring maintenance. For details, see Table 3-6.
*2 Maintenance work is performed using PCI hot plug (PHP). Combined with dynamic SR-IOV or the dynamic reconfiguration function for PCIe end point devices, it also enables active maintenance of a PCIe card assigned as the SR-IOV virtual function or PCIe end point, to an I/O domain.
*3 It is necessary to use the PCI Hot Plug (PHP) to release the link card mounted on a destination server from the system. If the setting for the direct I/O function is enabled, the link card cannot use PHP. So, release the link card from the system using physical partition dynamic reconfiguration (DR).
*4 This is supported only for a redundant configuration.

3.2 Types of Maintenance for the Link Card

This section describes the types of maintenance for the link card.
The link card is mounted in the PCI Express (PCIe) slot of the SPARC M10-1 or SPARC M10-4/M10-4S.
Table 3-4 lists the types of maintenance for the link card. The link card maintenance type refers to the status of the server side. The terms are defined as follows:

Definition according to the system operation status

The types of maintenance depend on the system operation status during maintenance. The supported maintenance is divided into three types: active maintenance, inactive maintenance, and system-stopped maintenance.

- Active maintenance
  Maintenance is performed when the physical partition to which an FRU requiring maintenance is assigned is operating.
- Inactive maintenance
  Maintenance is performed when the physical partition to which an FRU requiring maintenance is assigned is stopped.
- System-stopped maintenance
  Maintenance is performed with all physical partitions stopped.

Definition according to the power supply status

In addition, for each of the three: "Definition according to the system operation status," there are two types: hot maintenance and cold maintenance.

- Hot maintenance
  Maintenance is performed with the power cord of the server requiring maintenance connected.
- Cold maintenance
  Maintenance is performed with the power cord of the server requiring maintenance removed.

Table 3-4 Types of maintenance for the link card

-: Not maintainable

Mounting location	Active/hot (PHP)	Active/hot (DR)	Inactive/hot	Inactive/cold	System stopped/hot	System stopped/cold
SPARC M10-1	-	-	-	-	Enabled	Enabled
Configuration of 1 SPARC M10-4/ M10-4S	Enabled (*1)	-	-	-	Enabled	Enabled
SPARC M10-4S building block configuration	Enabled (*2)	Enabled (*3)	Enabled	Enabled	Enabled	Enabled

*1 It is necessary to use the PCI Hot Plug (PHP) to release the link card from the system. If the setting for the direct I/O function is enabled, then maintenance with the system stopped must be performed because the link card cannot use PHP.
*2 It is necessary to use the PCI Hot Plug (PHP) to release the link card from the system. If the setting for the direct I/O function is enabled, the link card cannot use PHP. Using physical partition dynamic reconfiguration (DR), release the link card from the system.
*3 Using physical partition dynamic reconfiguration (DR), it is necessary to release the server containing the link card from the physical partition.

3.3 Maintenance Types of the PCIe Card

This section describes the maintenance types of the PCIe card mounted in the PCI expansion unit.

3.3.1 Understanding the maintenance types of the PCIe card

The maintenance types of the PCIe card vary depending on the status of the PCIe card requiring maintenance. For details, see the following table.

Table 3-5 Maintenance types of the PCIe card of the PCI expansion unit (when the destination server has a single-unit configuration)

-: Not maintainable

Domain to which the PCI expansion unit belongs	PCIe card requiring maintenance			PCI card maintenance type	
	Direct I/O (*1)	PHP support	SR-IOV (*2)	Hot (use of PHP)	Cold
Control domain	Unsupported	Supported	Unsupported/ supported	Enabled (*3) (*5)	Enabled
	Unsupported	Unsupported	Unsupported/ supported	-	Enabled
	Supported	Unsupported	Unsupported	-	Enabled

Table 3-5 Maintenance types of the PCIe card of the PCI expansion unit (when the destination server has a single-unit configuration) *(continued)*

-: Not maintainable

Domain to which the PCI expansion unit belongs	PCIe card requiring maintenance			PCI card maintenance type	
	Direct I/O (*1)	PHP support	SR-IOV (*2)	Hot (use of PHP)	Cold
Root domain	Supported	Supported	Unsupported	Enabled (*6)	Enabled
	Unsupported	Supported	Unsupported	Enabled (*4)	Enabled
	Unsupported	Supported	Supported	Enabled (*4) (*5)	Enabled
	Unsupported	Unsupported	Unsupported/ supported	-	Enabled
	Supported	Unsupported	Unsupported/ supported	-	Enabled
	Supported	Supported	Unsupported	Enabled (*4) (*6)	Enabled

*1 This is a status in which the PCIe card of the PCI expansion unit is assigned to a logical domain using direct I/O.
*2 For details on whether to use the SR-IOV function, see "3.3.3 Checking whether the SR-IOV function is used."
*3 Execute PHP from the control domain.
*4 Execute PHP from the root domain.
*5 The PHP function provided when the SR-IOV function is used is supported by Oracle VM Server for SPARC 3.1 and later.
*6 Using the dynamic reconfiguration function for PCIe end point devices, return the card from the I/O domain with direct I/O to the control domain or root, and then execute PHP. The dynamic reconfiguration function for PCIe end point devices is supported by Oracle VM Server for SPARC 3.1.1.1 or later.

Table 3-6 Maintenance types of the PCIe card of the PCI expansion unit (when the destination server has a building block configuration)

-: Not maintainable

Domain to which the PCI expansion unit belongs	PCIe card requiring maintenance			Maintenance types of the PCIe card		
	Direct I/O (*1)	PHP support	SR-IOV (*2)	Hot (use of PHP)	Hot (use of DR)	Cold
Control domain	Unsupported	Supported	Unsupported/supported	Enabled (*3) (*8)	-	Enabled
	Unsupported	Unsupported	Unsupported/supported	-	-	Enabled
	Supported	Unsupported	Unsupported	-	-	Enabled
	Supported	Supported	Unsupported	Enabled (*9)	-	Enabled
Root domain	Unsupported	Supported	Unsupported	Enabled (*4)	Enabled (*5)	Enabled
	Unsupported	Supported	Supported	Enabled (*4) (*8)	Enabled (*6)	Enabled
	Unsupported	Unsupported	Unsupported	-	Enabled (*5)	Enabled
	Unsupported	Unsupported	Supported	-	Enabled (*6)	Enabled
	Supported	Unsupported	Unsupported	-	Enabled (*7)	Enabled

Table 3-6 Maintenance types of the PCIe card of the PCI expansion unit (when the destination server has a building block configuration) *(continued)*

-: Not maintainable

Domain to which the PCI expansion unit belongs	PCIe card requiring maintenance			Maintenance types of the PCIe card		
	Direct I/O (*1)	PHP support	SR-IOV (*2)	Hot (use of PHP)	Hot (use of DR)	Cold
	Supported	Supported	Unsupported	Enabled (*9)	Enabled (*7)	Enabled

*1 This is a status in which the PCIe card of the PCI expansion unit is assigned to a logical domain using direct I/O.
*2 For details on whether to use the SR-IOV function, see "3.3.3 Checking whether the SR-IOV function is used."
*3 Execute PHP from the control domain.
*4 Execute PHP from the root domain.
*5 Stop the root domain, and then execute physical partition dynamic reconfiguration (DR).
*6 Stop the I/O domain of the virtual function (VF) of the SR-IOV function, stop the root domain, delete and discard the VF of the SR-IOV function, and then execute physical partition dynamic reconfiguration (DR).
*7 Stop the I/O domain with direct I/O, stop the root domain, delete the I/O device, and then execute physical partition dynamic reconfiguration (DR).
*8 The PHP function provided when the SR-IOV function is used is supported by Oracle VM Server for SPARC 3.1 and later.
*9 Using the dynamic reconfiguration function for PCIe end point devices, return the card from the I/O domain with direct I/O to the control domain or root, and then execute PHP. The dynamic reconfiguration function for PCIe end point devices is supported by Oracle VM Server for SPARC 3.1.1.1 or later.

3.3.2 How to check whether PCI hot plug (PHP) can be used

Using PHP, maintenance for the PCIe card mounted on the PCI expansion unit or the link card mounted on the server can be performed during Oracle Solaris operation. This section enables you to check whether the PCIe card or link card requiring maintenance can use PHP.

Note - Some PCIe cards do not support PHP. For details, see "Appendix A Cards that Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.

Note - If the setting of the direct I/O function is enabled, the link card cannot use PHP.

1. **Log in to the XSCF shell.**
2. **Execute the showlogs command to identify the PCIe card requiring maintenance.**

```
XSCF> showlogs error
```

For details, see "Checking log information."

3. **Check the hardware and software configurations.**
For details, see "Confirming the System Configuration" in the *Fujitsu M10-1/SPARC M10-1 Service Manual* or in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*.

4. **Execute the ldm list-io -l command to check the logical domain to which the PCIe card requiring maintenance is assigned and the logical domain to which the PCIe root complex to which that PCIe card belongs is assigned.**

```
# ldm list-io -l
NAME                                      TYPE   BUS      DOMAIN   STATUS
----                                      ----   ---      ------   ------
PCIE0                                     BUS    PCIE0    primary
[pci@8000]
PCIE1                                     BUS    PCIE1    primary       <--(*1)
[pci@8100]
PCIE2                                     BUS    PCIE2    primary  IOV  <--(*2)
[pci@8200]
PCIE3                                     BUS    PCIE3    rootdom       <--(*3)
[pci@8300]
PCIE4                                     BUS    PCIE4    primary
[pci@8400]
PCIE5                                     BUS    PCIE5    primary  IOV
[pci@8500]
PCIE6                                     BUS    PCIE6    rootdom  IOV  <--(*4)
[pci@8600]
PCIE7                                     BUS    PCIE7    primary  IOV
[pci@8700]
/BB0/CMUL/NET0                            PCIE   PCIE0    primary  OCC
[pci@8000/pci@4/pci@0/pci@9]
network@0
network@0,1
/BB0/CMUL/SASHBA                          PCIE   PCIE0    primary  OCC
[pci@8000/pci@4/pci@0/pci@0]
scsi@0/iport@f/disk@w50000393a82368b2,0
scsi@0/iport@f/smp@w500000e0e06d03bf
scsi@0/iport@f/enclosure@w500000e0e06d03bd,0
scsi@0/iport@v0
/BB0/PCI0                                 PCIE   PCIE1    primary  OCC  <--(*5)
[pci@8100/pci@4/pci@0/pci@0]
/BB0/PCI3                                 PCIE   PCIE2    primary  EMP
[pci@8200/pci@4/pci@0/pci@0]
/BB0/PCI4                                 PCIE   PCIE2    iodom1   OCC  <--(*6)
[pci@8200/pci@4/pci@0/pci@8]
/BB0/PCI7                                 PCIE   PCIE3    rootdom  EMP
[pci@8300/pci@4/pci@0/pci@0]
/BB0/PCI8                                 PCIE   PCIE3    rootdom  EMP  <--(*7)
[pci@8300/pci@4/pci@0/pci@8]
/BB0/CMUL/NET2                            PCIE   PCIE4    primary  OCC
[pci@8400/pci@4/pci@0/pci@a]
network@0
network@0,1
/BB0/PCI1                                 PCIE   PCIE5    rootdom  EMP
[pci@8500/pci@4/pci@0/pci@8]
/BB0/PCI2                                 PCIE   PCIE5    rootdom  OCC
[pci@8500/pci@4/pci@0/pci@9]
/BB0/PCI5                                 PCIE   PCIE6    iodom2   OCC  <--(*8)
[pci@8600/pci@4/pci@0/pci@9]
/BB0/PCI6                                 PCIE   PCIE6    rootdom  OCC
```

```
[pci@8600/pci@4/pci@0/pci@11]
/BB0/PCI9                                PCIE   PCIE7    primary  OCC
[pci@8700/pci@4/pci@0/pci@9]
/BB0/PCI10                               PCIE   PCIE7    primary  OCC
[pci@8700/pci@4/pci@0/pci@11]
```

- **Logical domain to which the PCIe card is assigned**
  The name indicated in [DOMAIN] of the slot (line where [NAME] indicates "/BBX/PCIx") of the PCIe card requiring maintenance indicates the logical domain to which that PCIe card is assigned. (*5 to *8 in the execution example)
  *5 Assignment of both /BB0/PCI0 and PCIE1 to primary
  *6 Assignment of /BB0/PCI4 to iodom1 and PCIE2 to primary
  *7 Assignment of both /BB0/PCI8 and PCIE3 to rootdom
  *8 Assignment of /BB0/PCI5 to iodom2 and PCIE6 to rootdom
- **Logical domain to which the PCIe root complex to which the PCIe card belongs is assigned**
  Name "PCIEx" indicated in [BUS] in the line confirmed above indicates the name of the PCIe root complex to which the PCIe card belongs. The name indicated in [DOMAIN] of the same PCIe root complex (line where [NAME] indicates "PCIEx") indicates the logical domain to which the PCIe root complex to which the PCIe card belongs is assigned. (*1 to *4 in the execution example)
  *1 Assignment of PCIE1 to primary
  *2 Assignment of PCIE2 to primary
  *3 Assignment of PCIE3 to rootdom
  *4 Assignment of PCIE6 to rootdom

5. **Based on the check results in step 4, determine whether PHP can be used, according to the combination of above two pieces of information.**

- Suppose that the logical domains to which the PCIe slot and PCIe root complex are assigned are both the control domains (primary). Active/hot maintenance can be performed using PHP from the control domain. (See *5 in the execution example of the ldm list-io -l command)
- Suppose that the logical domains to which the PCIe slot and PCIe root complex are assigned are not control domains and are the same logical domains (root domains). Active/hot maintenance can be performed using PHP from the root domain. (See *7 in the execution example of the ldm list-io -l command)
- Other than above (when the assignment to the I/O domain is made using direct I/O): Active/hot maintenance can be performed using PHP after returning the PCIe slot from the I/O domain to the control domain or root by using the dynamic reconfiguration function for PCIe end point devices. (See *6 and *8 in the execution example of the ldm list-io -l command)
  However, this is supported only by Oracle VM Server for SPARC 3.1.1.1 or later.

3.3.3 Checking whether the SR-IOV function is used

This section checks whether the SR-IOV function is used.

Note - For details on the PCIe card supporting the SR-IOV function, see "Appendix B Cards that Support SR-IOV" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.

1. **Log in to the XSCF shell.**
2. **Execute the showlogs command to identify the PCIe card requiring maintenance.**

```
XSCF> showlogs error
```

3. **Connect to the control domain console of the physical partition.**
4. **Execute the ldm list-io command to determine whether the SR-IOV function is being used.**
   "VF" displayed in [TYPE] indicates that the SR-IOV function is being used.

```
# ldm list-io
NAME                              TYPE   BUS      DOMAIN   STATUS
----                              ----   ---      ------   ------
PCIE0                             BUS    PCIE0    primary  IOV
PCIE1                             BUS    PCIE1    primary  IOV
PCIE2                             BUS    PCIE2    primary  IOV
PCIE3                             BUS    PCIE3    primary  IOV
PCIE4                             BUS    PCIE4    primary  IOV
PCIE5                             BUS    PCIE5    primary  IOV
PCIE6                             BUS    PCIE6    primary  IOV
PCIE7                             BUS    PCIE7    primary  IOV
/BB0/CMUL/NET0                    PCIE   PCIE0    primary  OCC
/BB0/CMUL/SASHBA                  PCIE   PCIE0    primary  OCC
/BB0/PCI0                         PCIE   PCIE1    primary  OCC
/BB0/PCI3                         PCIE   PCIE2    primary  EMP
/BB0/PCI4                         PCIE   PCIE2    primary  EMP
/BB0/PCI7                         PCIE   PCIE3    primary  EMP
/BB0/PCI8                         PCIE   PCIE3    primary  EMP
/BB0/CMUL/NET2                    PCIE   PCIE4    primary  OCC
/BB0/PCI1                         PCIE   PCIE5    primary  EMP
/BB0/PCI2                         PCIE   PCIE5    primary  EMP
/BB0/PCI5                         PCIE   PCIE6    primary  EMP
/BB0/PCI6                         PCIE   PCIE6    primary  EMP
/BB0/PCI9                         PCIE   PCIE7    primary  EMP
/BB0/PCI10                        PCIE   PCIE7    primary  EMP
/BB0/PCI0/IOVNET.PF0              PF     PCIE1    primary
/BB0/PCI0/IOVNET.PF1              PF     PCIE1    primary
/BB0/CMUL/NET0/IOVNET.PF0         PF     PCIE0    primary
/BB0/CMUL/NET0/IOVNET.PF1         PF     PCIE0    primary
/BB0/CMUL/NET2/IOVNET.PF1         PF     PCIE4    primary
/BB0/CMUL/NET2/IOVNET.PF0         PF     PCIE4    primary
/BB0/PCI0/IOVNET.PF0.VF0          VF     PCIE1    iodom00  <--SR-IOV function used
/BB0/PCI0/IOVNET.PF0.VF1          VF     PCIE1    iodom01  <--SR-IOV function used
/BB0/PCI0/IOVNET.PF0.VF2          VF     PCIE1    iodom02  <--SR-IOV function used
```

Chapter 4

Preparation and Precautions for Maintenance

This chapter describes preparations that must be completed prior to maintenance and the precautions for various work and maintenance.

- Troubleshooting
- Precautions for Maintenance

4.1 Troubleshooting

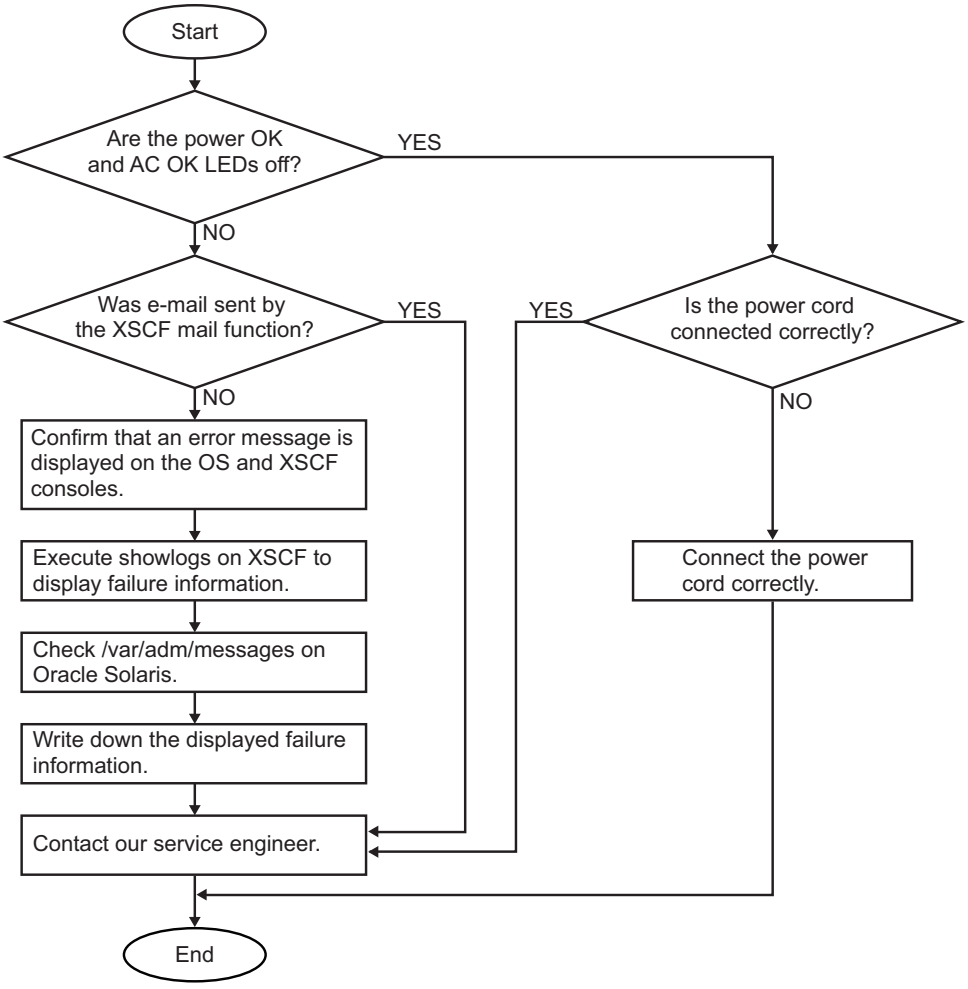
This section explains suspected failure conditions. Use the flow to determine the cause of a failure and identify the failure location in the following cases. For details on the flow for determining the cause of a failure, see "4.1.1 Determining the causes of individual failures."

- When the CHECK LED is on
- When an error message is displayed on the console
- When an error is displayed as a result of executing a command for checking the status
- When an error is displayed in the error log

4.1.1 Determining the causes of individual failures

This section explains the flow for determining the causes of failures.

Figure 4-1 Troubleshooting flow


Start
Are the power OK and AC OK LEDs off?
YES
NO
Was e-mail sent by the XSCF mail function?
YES
NO
Is the power cord connected correctly?
YES
NO
Confirm that an error message is displayed on the OS and XSCF consoles.
Execute showlogs on XSCF to display failure information.
Check /var/adm/messages on Oracle Solaris.
Write down the displayed failure information.
Contact our service engineer.
Connect the power cord correctly.
End

4.1.2 Identifying a failure

This section explains the method for identifying a failure. Use the flow described in "4.1.1 Determining the causes of individual failures" to determine the appropriate way of checking for a failure.

Checking the LED indications

Identify the component requiring maintenance by checking the LEDs on both the front and rear panels of the PCI expansion unit, and the LEDs on the link card of the server to which the PCI expansion unit is connected. To maintain a component, determine its status from the LEDs and then start the maintenance work.

- LEDs on front of PCI expansion unit
  The status of the PCI expansion unit or fan unit can be determined by checking the LED or CHECK LED on the respective devices. For details, see "2.2.1 Front LEDs on the PCI expansion unit."
- LEDs on rear of PCI expansion unit
  By checking the LEDs mounted on the components that can be maintained, the status of each component or the error location can be determined. For details, see "2.2.2 LEDs on rear of PCI expansion unit."
- LEDs on link card
  Check the LED on the link card of the server to which the PCI expansion unit is connected. For details, see "2.2.3 LEDs on link card."

Checking error messages

Display the error messages to check the log information and obtain an error overview. You can use either of the following two methods to check the error messages:

- Checking the error log information with the XSCF shell
  For details, see "12.1 Checking Log Saved with XSCF" in the *SPARC M10 Systems System Operation and Administration Guide*.
- Checking messages on Oracle Solaris
  For details, see "12.2 Checking Warning and Notification Messages" in the *SPARC M10 Systems System Operation and Administration Guide*.

Checking the status

Execute the command to check the status of the PCI expansion unit, PCI Express (PCIe) card, or the system.
Table 4-1 lists the commands for checking the status.

Table 4-1 Status check command

Type	Command	Description
XSCF	ioxadm	Displays information on the PCI expansion unit. The system administrator and service engineer can manage the PCI expansion unit by executing the ioxadm command.
OpenBoot PROM	show-devs	Displays device tree information on the PCIe card and other devices connected to the host. Execute this command from the ok prompt.
Oracle Solaris	prtdiag	Displays the system configuration and all Field Replaceable Units (FRUs) that have experienced failures. Execute this command from the Oracle Solaris super-user prompt. "FRU" refers to any component that can be replaced by a field engineer.

The command execution examples shown here are based on the assumption that PCIe cards are inserted into all of the slots.

ioxadm command

Execute the ioxadm command to determine the environmental conditions (temperature, voltage, etc.) or LED indications of the PCI expansion unit.

1. **Log in to the XSCF shell.**
2. **Execute the ioxadm command to check the environmental conditions of the specified PCI expansion unit.**
   The following example shows the environmental conditions for the PCIBOX#2008 "2008" is the last four digits of the serial number of the PCI expansion unit.

```
XSCF> ioxadm env -te PCIBOX#2008
Location                    Sensor            Value Resolution Units
PCIBOX#2008                 AIRFLOW         180.000      0.000 CHM
PCIBOX#2008                 P_CONSUMPTION    68.000      0.000 W
PCIBOX#2008/PSU#0           FAN            3936.000      0.000 RPM
PCIBOX#2008/PSU#1           FAN            3584.000      0.000 RPM
PCIBOX#2008/FAN#0           FAN            3374.000      0.000 RPM
PCIBOX#2008/FAN#1           FAN            3374.000      0.000 RPM
PCIBOX#2008/FAN#2           FAN            3374.000      0.000 RPM
PCIBOX#2008/IOB             T_INTAKE         26.000      0.000 C
PCIBOX#2008/IOB             T_PART_NO0       31.500      0.000 C
PCIBOX#2008/IOB             T_PART_NO1       30.750      0.000 C
PCIBOX#2008/IOB             T_PART_NO2       31.500      0.000 C
PCIBOX#2008/IOB             V_12_0V          12.069      0.000 V
PCIBOX#2008/IOB             V_3_3_NO0         3.293      0.000 V
PCIBOX#2008/IOB             V_3_3_NO1         3.295      0.000 V
PCIBOX#2008/IOB             V_3_3_NO2         3.291      0.000 V
PCIBOX#2008/IOB             V_3_3_NO3         3.300      0.000 V
PCIBOX#2008/IOB             V_1_8V            1.804      0.000 V
PCIBOX#2008/IOB             V_0_9V            0.900      0.000 V
```

show-devs command

Execute the show-devs command of OpenBoot PROM to display the path from the host server to the PCIe card on the I/O board.

1. **Display the ok prompt.**
2. **Execute the show-devs command to check the device tree information.**

```
{0} ok show-devs
/pci-performance-counters@8100
/pci-performance-counters@8000
/pci@8100
/pci@8000
/cpu@1f
/cpu@1e
/cpu@1d
/cpu@1c
/cpu@1b
```

```
/cpu@1a
/cpu@19
/cpu@18
/cpu@17
/cpu@16
/cpu@15
/cpu@14
/cpu@13
/cpu@12
/cpu@11
/cpu@10
/cpu@f
/cpu@e
/cpu@d
/cpu@c
/cpu@b
/cpu@a
/cpu@9
/cpu@8
/cpu@7
/cpu@6
/cpu@5
/cpu@4
/cpu@3
/cpu@2
/cpu@1
/cpu@0
/virtual-devices@100
/iscsi-hba
/virtual-memory
/memory@m7e00,60000000
/aliases
/options
/openprom
/chosen
/packages
/pci@8100/pci@4
/pci@8100/pci@4/pci@0
/pci@8100/pci@4/pci@0/pci@9
/pci@8100/pci@4/pci@0/pci@1
/pci@8100/pci@4/pci@0/pci@0
/pci@8100/pci@4/pci@0/pci@0/network@0,1
/pci@8100/pci@4/pci@0/pci@0/network@0
/pci@8000/pci@4
/pci@8000/pci@4/pci@0
/pci@8000/pci@4/pci@0/pci@8
/pci@8000/pci@4/pci@0/pci@2
/pci@8000/pci@4/pci@0/pci@1
/pci@8000/pci@4/pci@0/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11
```

```
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@8
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@1
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@11
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@10
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@1
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@11/pci@0/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@11
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@10
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@1
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@1/
FJSV,eulsa@0
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@1/
FJSV,eulsa@0/tape
/pci@8000/pci@4/pci@0/pci@8/pci@0/pci@0/pci@0/pci@1/pci@0/pci@10/pci@0/pci@1/
FJSV,eulsa@0/disk
/pci@8000/pci@4/pci@0/pci@2/pci@0
/pci@8000/pci@4/pci@0/pci@2/pci@0/usb@4,1
/pci@8000/pci@4/pci@0/pci@2/pci@0/usb@4
/pci@8000/pci@4/pci@0/pci@1/network@0,1
/pci@8000/pci@4/pci@0/pci@1/network@0
/pci@8000/pci@4/pci@0/pci@0/scsi@0
/pci@8000/pci@4/pci@0/pci@0/scsi@0/disk
/pci@8000/pci@4/pci@0/pci@0/scsi@0/tape
/virtual-devices@100/channel-devices@200
/virtual-devices@100/flashprom@0
/virtual-devices@100/rtc@5
/virtual-devices@100/console@1
/virtual-devices@100/channel-devices@200/virtual-domain-service@0
/virtual-devices@100/channel-devices@200/virtual-channel@3
/virtual-devices@100/channel-devices@200/virtual-channel-client@2
/virtual-devices@100/channel-devices@200/virtual-channel-client@1
/virtual-devices@100/channel-devices@200/virtual-channel@0
/iscsi-hba/disk
/openprom/client-services
/packages/obp-tftp
/packages/kbd-translator
/packages/SUNW,asr
/packages/dropins
/packages/terminal-emulator
/packages/disk-label
/packages/deblocker
/packages/SUNW,probe-error-handler
/packages/SUNW,builtin-drivers
{0} ok
```

prtdiag command

Execute the prtdiag(1M) command of Oracle Solaris to determine the system configuration and any failed FRUs.

1. **Display the Oracle Solaris super-user prompt.**
2. **Execute the prtdiag(1) command to determine the system configuration and any failed FRUs.**

```
# prtdiag -v
System Configuration:  Oracle Corporation  sun4v SPARC M10-4
Memory size: 64000 Megabytes

------------------------Omitted-------------------------

================================ IO Devices ================================
Slot +            Bus   Name +                              Model      Speed
Status            Type  Path
----------------------------------------------------------------------------
/BB0/CMUL/SASHBA  PCIE  scsi-pciex1000,87                    LSI,2308_2 5.0GTx8
                        /pci@8000/pci@4/pci@0/pci@0/scsi@0
/BB0/CMUL/NET0    PCIE  network-pciex14e4,1656                           2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@9/network@0
/BB0/CMUL/NET1    PCIE  network-pciex14e4,1656                           2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@9/network@0,1
/BB0/CMUL/NET2    PCIE  network-pciex14e4,1656                           2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@a/network@0
/BB0/CMUL/NET3    PCIE  network-pciex14e4,1656                           2.5GTx1
                        /pci@8000/pci@4/pci@0/pci@a/network@0,1

------------------------Omitted-------------------------

Chassis Serial Number
---------------------
2081203001
#
```

Checking log information

Execute the showlogs command to check the error log information.

1. **Log in to the XSCF shell.**
2. **Execute the showlogs command to determine the error log information.**
   The log information is listed in the order of date, with the oldest appearing first.

   The following example shows that an Alarm status occurred in PSU#1 and PSU#2 at 12:45:31 on Oct 20, the Alarm status changed to a Warning status at 15:45:31 on the same day, and then the Alarm status further expanded to PSU#1, PSU#2, and PSU#3 at 17:45:31 on the same day.

```
XSCF> showlogs error
Date: Oct 20 12:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Alarm                 Occurred: Oct 20 12:45:31.000 JST 2012
    FRU: PSU#1,PSU#2
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
```

```
Date: Oct 20 15:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Warning                 Occurred: Oct 20 15:45:31.000 JST 2012
    FRU: PSU#1,PSU#2
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
Date: Oct 20 17:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Alarm                   Occurred: Oct 20 17:45:31.000 JST 2012
    FRU: PSU#1,PSU#2, PSU#3,*
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
```

4.1.3 Locating the PCI expansion unit requiring maintenance

This section describes the procedure for locating a PCI expansion unit requiring maintenance by causing the CHECK LED (locator) on the front panel of the chassis to blink.
Execute the ioxadm command of the XSCF firmware to cause the CHECK LED for the PCI expansion unit requiring maintenance to blink to locate it. For details on the location of the CHECK LED and the procedure for checking it, see "2.2.1 Front LEDs on the PCI expansion unit."

1. **Log in to the XSCF shell.**
2. **Execute the ioxadm command to cause the CHECK LED of the PCI expansion unit requiring maintenance to blink to locate it.**
   In the following example, the CHECK LED of PCIBOX#2008 is specified.

```
XSCF> ioxadm locator on PCIBOX#2008
Location Sensor Value Resolution Units
PCIBOX#2008 LOCATE Blink - LED
PCIBOX#2008/FAN#0 SERVICE Blink - LED
```

4.2 Precautions for Maintenance

This section describes the precautions for maintenance.

4.2.1 Precautions for replacement

This section describes the precautions for replacement.

Precautions for PCIe card replacement

- For active maintenance by PHP, a multipath setting is necessary depending on the use of the PCIe cards.
- For active maintenance by PHP, confirm that the card is PHP supported. To do so, check "Appendix A Cards that Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.
  If you perform active replacement by combining PHP with dynamic SR-IOV or the dynamic reconfiguration function for PCIe end point devices, confirm that the card supports the relevant function. Check "Appendix B Cards that Support SR-IOV" and "Appendix D Cards that support the dynamic reassignment function for the PCIe end point device (PCIe card)" in the same manual.

Precautions for link card replacement

- The link card replacement procedure is the same as the replacement procedure for PCIe cards on the server side. See the service manual for each server.
- Before replacing the link card, check the firmware version. The firmware of the PCI expansion unit has been installed on the link card and the I/O board. When replacing the link card, however, the firmware version cannot be automatically matched to the one before the replacement. For this reason, you must use a confirmed firmware version to match it to the firmware version before the replacement. If you cannot recognize the PCI expansion unit from the XSCF, check the firmware version of a part that has not been replaced after the replacement to match it to the firmware version before the replacement.
- When you replace the I/O board and the link card at the same time, check the firmware version before the replacement. If you replace the I/O board and the link card at the same time without checking the firmware version, you may not be able to match the version.
- If multiple PCI expansion units are used and the firmware versions match within the combinations, there will be no problem with the operation even if firmware versions differ among PCI expansion units.

Note the following when mounting a link card using PHP.

- When mounting the link card on the system using PHP, do so with the PCIe card of the PCI expansion unit pulled out.

Precautions for link cable replacement

- Do not place any heavy objects on the link cables.
- When performing replacement, replace the two link cables as a set.
- Do not bend the link cables unduly. Excessive bending could damage the link cables. The allowable bending radius for each link cable is shown below.
  Link cable (electrical): Static/dynamic 40 mm (1.6 in.) or greater

  Link cable (optical): Static 35 mm (1.4 in.) or greater/dynamic 58 mm (2.3 in.) or greater
- Before use, confirm that labels (A in the figure) are affixed to the connectors at both ends of the link cable. For the location of the labels, see Figure 4-3 and Figure 4-4.

Figure 4-2 Label location on a link cable (electrical)

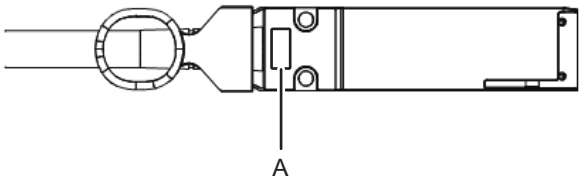
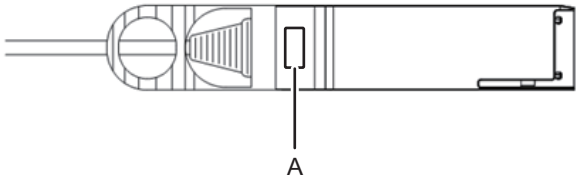
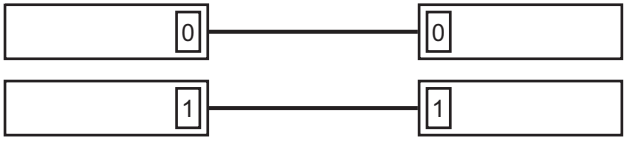


Figure 4-3 Label location on a link cable (optical)



If there is no label, affix one of the labels supplied with the link cable. Affix labels with the same number (0 or 1) to the connectors at both ends of the link cable.

Figure 4-4 State of labels when correctly attached



Notes on power supply unit replacement

- Hot maintenance is supported only for a redundant configuration.
- The power supply has a redundant configuration featuring two units. Thus, the system can continue to function even if one of these units fails. The system should not, however, be operated for an extended period with one failed unit.
- When multiple power supply units are to be replaced, perform the replacement one by one. If redundancy of the power supply units cannot be secured, cold maintenance must be executed.
- Do not force a power supply unit into its slot. Using excessive force may damage the component or the chassis.

Precautions for fan unit replacement

- When replacing multiple fan units, replace no more than one unit at a time. If the redundancy of the fan units cannot be secured, system-stopped maintenance must be executed.
- The fan units have a redundant configuration; therefore, even if one fan unit fails, the system can continue operating. Do not, however, operate the system for an extended period with a failed fan unit. Replace the failed fan unit as quickly as possible.

Precautions for I/O board replacement

- Before replacing the I/O board, check the firmware version. The firmware of the PCI expansion unit has been installed on the link card and the I/O board. When replacing the I/O board, however, the firmware version cannot be automatically matched to the one before the replacement. For this reason, you must use a confirmed firmware version to match it to the firmware version before the

replacement. If you cannot recognize the PCI expansion unit from the XSCF, check the firmware version of a part that has not been replaced after the replacement to match it to the firmware version before the replacement.

- When you replace the I/O board and the link card at the same time, check the firmware version before the replacement. If you replace the I/O board and the link card at the same time without checking the firmware version, you may not be able to match the version.
- Do not replace the I/O board and the fan backplane at the same time. When you replace the I/O board and the fan backplane at the same time, all the serial numbers of the PCI expansion unit are changed to 0 ("0000000000"). If all these serial numbers are changed to 0 ("0000000000"), use the ioxadm command of the XSCF firmware to restore the serial numbers. If you replace both the I/O board and the fan backplane, replace either one, and then start the physical partition connected to the PCI expansion unit to determine the error log information on the PCI expansion unit. After confirming that no error log information is displayed, replace the other Field Replaceable Unit (FRU).
- If multiple PCI expansion units are used and they are combined such that their firmware versions match, there will be no problem with the operation even if the PCI expansion units are using different firmware versions.

Precautions for updating the firmware

- Always read the latest Product Notes.
- It is not possible to update the firmware on more than one unit at a time. Update the firmware one unit at at time.
- The firmware can be updated if any of the following conditions are met when the system is operating and the PCI expansion unit can be recognized from the XSCF.
  - The PCI expansion unit is displayed when executing the ioxadm command.
  - The control domain to which the PCI expansion unit is connected is started and runs until the OpenBoot PROM state is set.
- Do not operate the system power supply during firmware update. To reflect the applied firmware, restart the physical partition or the I/O domain to which the PCI expansion unit belongs, or turn on the power again. Ask the system administrator to do this.
- If multiple PCI expansion units are being used and are combined in such a way that their firmware versions match, there will be no problem with their operation even if some of the PCI expansion units use different firmware versions.

4.2.2 Precautions for installation

The following describes precautions for installation.

- For PCIe card installation by PHP, a multipath setting is necessary depending on the use of the PCIe cards.
- For active addition by PHP, confirm that the card is PHP supported. To do so, check "Appendix A Cards that Support PCI Hot Plug and Dynamic Reconfiguration"

in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.
If you perform active addition by combining PHP with dynamic SR-IOV or the dynamic reconfiguration function for PCIe end point devices, confirm that the card supports the relevant function. Check "Appendix B Cards that Support SR-IOV" and "Appendix D Cards that Support the Dynamic Reassignment Function for PCIe End Point Devices (PCIe Cards)" in the same manual.

- If you are performing PCIe card expansion, remove the filler unit from the PCIe card cassette. Store the removed filler in a safe place because it will be needed if you subsequently remove the PCIe card.
- For details on the work for installing a PCI expansion unit, see the *Fujitsu M10/SPARC M10 Systems Installation Guide*.

4.2.3 Precautions for removal

The following describes precautions for removal.

- For PCIe card removal by PHP, release of the multipath is necessary depending on the use of the PCIe cards.
- For active removal by PHP, confirm that the card is PHP supported. To do so, check "Appendix A Cards that Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.
  If you perform active removal by combining PHP with dynamic SR-IOV or the dynamic reconfiguration function for PCIe end point devices, confirm that the card supports the relevant function. Check "Appendix B Cards that Support SR-IOV" and "Appendix D Cards that Support the Dynamic Reassignment Function for PCIe End Point Devices (PCIe Cards)" in the same manual.
- When performing PCIe card removal, remove the PCIe card from the PCIe card cassette and then attach the filler that has been stored in a safe place.

Chapter 5

Preparations Required for Maintenance

This chapter describes the preparations that must be completed before you can physically remove a component. See this chapter, as required, when performing the maintenance work on each component described in Chapter 7 onwards.

- Preparing Tools Required for Maintenance
- Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition
- Releasing the Link Card or PCIe Card from the System
- Stopping the FRU Requiring Maintenance
- Accessing an FRU

Caution - Do not operate a Field Replaceable Unit (FRU) requiring maintenance while OpenBoot PROM is running (the ok prompt is displayed). Turn off the power to the physical partition or start Oracle Solaris to release the PCI expansion unit from the server, and then operate the FRU requiring maintenance.

5.1 Preparing Tools Required for Maintenance

This section explains the tools required for maintenance. Table 5-1 lists the tools required for maintenance.

Table 5-1 Maintenance tools

Item	Use
Phillips screwdriver (No.2)	Removing or replacing screws
Wrist strap	For grounding static electricity
ESD mat	For grounding static electricity

5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition

This section checks the PCI expansion unit requiring maintenance and the physical partition to which the PCI expansion unit belongs.

1. **Log in to the XSCF shell.**
2. **Execute the ioxadm locator command to cause the CHECK LED of the PCI expansion unit requiring maintenance to blink so that you can locate the unit.**
   You do not have to perform this step when performing maintenance on the link card mounted on a server.

   In the following example, the CHECK LED of PCIBOX#2007 is specified.

```
XSCF> ioxadm locator on PCIBOX#2007
```

3. **For the building block configuration of the SPARC M10-4S, execute the ioxadm list command to check the BB-ID of the server that is connected to the PCI expansion unit requiring maintenance.**
   The following example shows that the BB-ID is "BB#01."

```
XSCF> ioxadm list PCIBOX#2007
PCIBOX                  Link
PCIBOX#2007             BB#01-PCI#05
```

4. **For the building block configuration of the SPARC M10-4S, execute the showboards -a command to check the PPAR-ID of the physical partition using the link card.**
   The BB-ID of the server to which the PCI expansion unit requiring maintenance is connected is displayed as a system board (PSB) number.

   In the following example, the [PPAR-ID] of PSB 01-0 is "01."

```
XSCF> showboards -a
PSB  PPAR-ID(LSB) Assignment  Pwr  Conn Conf Test    Fault
---- ------------ ----------- ---- ---- ---- ------- --------
00-0 00(00)       Assigned    y    y    y    Passed  Normal
01-0 00(01)       Assigned    y    y    y    Passed  Normal
```

5.3 Checking the Firmware Version of the PCI Expansion Unit

This section describes the procedure for checking the firmware version of the PCI expansion unit.

The link card and I/O board contain the PCI expansion unit firmware. The firmware version cannot be automatically matched to the pre-replacement firmware version when the link card or I/O board is replaced. Before proceeding with the replacement, check the firmware version.

1. **Log in to the XSCF shell.**
2. **If multiple PCI expansion units are connected, execute the ioxadm list command to check the combination of the link card and the I/O board.**

```
XSCF> ioxadm list
PCIBOX         Link
PCIBOX#2007    BB#00-PCI#10
PCIBOX#2006    BB#00-PCI#09
PCIBOX#2005    BB#00-PCI#08
PCIBOX#2004    BB#00-PCI#07
```

3. **Execute the ioxadm -v list command to check the serial number and the firmware version of the PCI expansion unit.**
   [Location] displays the last four digits of the serial number of the PCI expansion unit, and [FW Ver] displays the firmware version of the link card ("CARD" shown on [Type]) and that of the I/O board ("IOBOARD" shown on [Type]).

   The following example shows that "2007" is the last four digits of the serial number of the PCI expansion unit and "1080" is the firmware version of the link card and the I/O board.

```
XSCF> ioxadm -v list
Location           Type     FW Ver  Serial Num           Part Num           State
PCIBOX#2007         PCIBOX    -      PZ21242007                                On
PCIBOX#2007/PSU#0   PSU       -      FEJD1212000521 CA01022-0750-D/7060988     On
PCIBOX#2007/PSU#1   PSU       -      FEJD1201000738 CA01022-0750-D/7060988     On
PCIBOX#2007/IOB     IOBOARD 1080     PP12470297     CA20365-B66X 010AJ/7061033 On
PCIBOX#2007/LINKBD BOARD      -      PP1244027P     CA20365-B60X 001AA/7061035 On
PCIBOX#2007/FANBP   FANBP     -      PP12470298     CA20365-B68X 005AD/7061025 On
BB#00-PCI#10        CARD     1080    PP124401LZ     CA20365-B59X 001AA/7061040 On
```

A firmware version is displayed as a four-digit release number in "xyyz" format. Each release number is indicated in "xyyz" format, as follows.

- x: Major release number
- yy: Minor release number

- z: Micro release number

5.4 Checking the Operating Condition and Resource Usage Status

This section describes how to check the operating condition of the logical domain and the resource usage status before maintenance is performed on each FRU.

5.4.1 Checking the operating condition of the physical partition or logical domain

In the following execution example, the operating condition of the physical partition and logical domain is checked from firmware.

1. **Log in to the XSCF shell.**
2. **Execute the showpparstatus command to confirm the operating condition of the physical partition.**
   In the following example, [PPAR Status] of PPAR-ID 00 displays "Running", which indicates that the physical partition is operating.

```
XSCF> showpparstatus -p 0
PPAR-ID         PPAR Status
00              Running
```

3. **Execute the showdomainstatus command to confirm the operating condition of the logical domain.**
   In the following example, [Status] of the logical domains of PPAR-ID 00 displays "Solaris running," which indicates that Oracle Solaris is operating.

```
XSCF> showdomainstatus -p 0
Logical Domain Name   Status
primary               Solaris running
guest0                Solaris running
guest1                Solaris running
iodom0                Solaris running
iodom1                Solaris running
sdiodomain            Solaris running
sr-iodomain           Solaris running
```

5.4.2 Checking the assignment status of I/O devices

In the following execution example, the operating condition of the logical domain, the resource usage status, and the assignment status of I/O devices are checked from Oracle Solaris on the logical domain. For details, see "3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu M10/SPARC M10 Systems Domain Configuration Guide*.

1. **Log in to Oracle Solaris on the logical domain.**
2. **Execute the following ldm command to check the operating condition of the logical domain.**

```
# ldm list-domain
```

3. **Execute the following ldm command to check the resource usage status.**

```
# ldm list-devices -a
```

4. **Execute the following ldm command to check the assignment status of I/O devices.**

```
# ldm list-io
```

For maintenance on a PCIe card, retain the output data of the ldm list-io command, since you will need it later when restoring the original configuration ("6.4 Restoring the Logical Domain to the Status It Had before Maintenance") after maintenance.

5.4.3 Checking the usage status of the internal disk

In the following execution example, the configurations and states of devices in pools and errors generated from the devices are checked.

1. **Log in to Oracle Solaris on the logical domain.**
2. **Execute the zpool status command to check the configurations and operating conditions of devices.**
   The following example shows that the system volume of the control domain has a mirror configuration.

```
# zpool status rpool
  pool: rpool
  state: ONLINE
   scan: resilvered 28.7M in 0h0m with 0 errors on Tue Jan 21 10:10:01 2014
config:
```

```
        NAME                              STATE      READ WRITE CKSUM
        rpool                             ONLINE        0     0     0
            mirror-0                      ONLINE        0     0     0
               c2t50000393E802CCE2d0s0 ONLINE        0     0     0
               c3t50000393A803B13Ed0s0 ONLINE        0     0     0
errors: No known data errors
```

5.5 Releasing the Link Card or PCIe Card from the System

This section describes the procedure for releasing the link card mounted on the server or a PCIe card mounted in the PCI expansion unit, from the system.
These cards are released from the system using one of the following methods: Using the PCI hot plug (PHP), using physical partition dynamic reconfiguration (DR), and stopping the system.

Note - The link card is mounted in the PCI Express (PCIe) slot of the SPARC M10-1 or SPARC M10-4/M10-4S. The procedure for removing the link card is the same as that for removing a PCIe card mounted on the SPARC M10-1 or SPARC M10-4/M10-4S. For details on the SPARC M10-1, see "8.3 Removing a PCI Express Card" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*. For details on the SPARC M10-4/M10-4S, see "8.4 Removing a PCI Express Card" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*.

Note - If the setting of the direct I/O function is enabled, the link card cannot be released by using PHP. Using physical partition dynamic reconfiguration (DR), release the chassis requiring maintenance from the system.

Note - To add or delete an I/O device in the control or root domain, enter delayed reconfiguration mode, add or delete the I/O device, and then restart the domain.
However, a combination of XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later supports the dynamic reconfiguration function for PCIe end point devices. Therefore, you do not need to place the domain in delayed reconfiguration mode or restart the domain. Before adding or deleting the I/O device, enable the hotplug service.

5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)

This section describes the procedure for releasing the link card or PCIe card from the system using PCI hot plug (PHP).

1) Stopping the use of the I/O device

If there is any logical domain that is physically or virtually using the PCIe card mounted in the chassis requiring maintenance, stop the use of the I/O device to keep it unused.

Releasing the I/O device in the case of a redundant configuration

With the duplication function, release the target I/O device so that it will not be used. For details on the work, see the manual for the application being used.

Stop the use of the I/O device in the case of a non-redundant configuration

Place the I/O device in the unused state, such as by deactivating the network or unmounting the disk. For details on the work, see the document of Oracle Solaris or the manual for the application being used.

2) Deleting the assignment of the I/O

In the case that a virtual I/O is used

If the virtual I/O service is used, delete the virtual I/O device. For details, see the *Oracle VM Server for SPARC Administration Guide* released by Oracle.

In the case that the PCIe end point assignment is used

If the PCIe end point device of the chassis requiring maintenance is assigned to an I/O domain, delete the PCIe end point device from the I/O domain and return it to the root domain (including the control domain). The work procedure depends on whether the dynamic reconfiguration function for PCIe end point devices is used. For details, see Table 5-2.

Table 5-2 Differences in the procedures according to whether the dynamic reconfiguration function for PCIe end point devices is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used. (*2)
1	Enabling the hotplug service	svcadm enable hotplug	Perform	Perform (*3)
2	Stopping the I/O domain	ldm stop-domain	-	Perform
3	Deleting the PCIe end point device from the I/O domain	ldm remove-io	Perform	Perform
4	Setting the root domain in delayed reconfiguration mode	ldm start-reconf	-	Perform
5	Assigning the PCIe end point device to the root domain	ldm add-io	Perform	Perform
6	Restarting the root domain	shutdown -i6 -g0 -y	-	Perform

Table 5-2 Differences in the procedures according to whether the dynamic reconfiguration function for PCIe end point devices is used *(continued)*

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used. (*2)
7	Disabling the hotplug service	svcadm disable hotplug	Perform	Perform (*3)

*1 Dynamic reconfiguration for PCIe end point devices is supported by XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.
*2 If dynamic reconfiguration for PCIe end point devices is not used, stop the I/O domain, delete the physical I/O device, and then restore the physical I/O device to the root domain.
*3 If dynamic reconfiguration for PCIe end point devices is not used, the hotplug service operates whether it is enabled or disabled.

Note - Note the following when deleting a physical I/O device (PCIe end point device) of the boot disk:
- If the boot disk is in a redundant configuration, stop the I/O domain for Oracle VM Server for SPARC 3.1.1 or earlier. (For Oracle VM Server for SPARC 3.1.1.1 or later, you do not need to stop the I/O domain.)
- If the boot disk is not in a redundant configuration, stop the I/O domain.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable hotplug command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Stop the I/O domain.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 3.

```
# ldm stop-domain <I/O domain name>
```

3. **Delete the physical I/O device from the I/O domain.**

```
# ldm remove-io <device name> <I/O domain name>
```

4. **Transition the root domain to delayed reconfiguration mode.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 5.

```
# ldm start-reconf <root domain name>
```

5. **Reassign the physical I/O device deleted in step 3 to the root domain.**

```
# ldm add-io <device name> <root domain name>
```

6. **Log in to the root domain, and restart Oracle Solaris.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 7.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

In the case that the virtual function of SR-IOV is used

If the virtual function (VF) using the SR-IOV function has been created for a PCIe card mounted on the PCI expansion unit and it has been assigned to the domain, execute the ldm command from the control domain to delete and discard the virtual function. The work procedure is different for the dynamic SR-IOV function or for static SR-IOV function. For details, see Table 5-3.
For details on the procedure, see the *Oracle VM Server for SPARC Administration Guide* released by Oracle.

Table 5-3 Differences in the releasing procedures between the dynamic SR-IOV function and static SR-IOV function

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function is used. (*1)	Static SR-IOV function function is used.
1	Enabling the hotplug service	svcadm enable hotplug	Perform	Perform (*2)
2	Stopping the I/O domain	ldm stop-domain	-	Perform
3	Deleting the VF from the I/O domain	ldm remove-io	Perform	Perform
4	Setting the root domain of the PF in delayed reconfiguration mode	ldm start-reconf	-	Perform
5	Discarding the VF	ldm destroy-vf	Perform	Perform
6	Restarting the root domain	shutdown -i6 -g0 -y	-	Perform
7	Disabling the hotplug service	svcadm disable hotplug	Perform	Perform (*2)

*1 Dynamic reconfiguration for the virtual function of SR-IOV is supported by XCP 2210 or later and Oracle VM Server for SPARC 3.1 or later.
*2 If static reconfiguration for the virtual function of SR-IOV is used, the hotplug service operates whether it is enabled or disabled.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable hotplug command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Stop the I/O domain.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 3**.**

```
# ldm stop-domain <I/O domain name>
```

3. **Remove the virtual function (VF) assigned to the I/O domain, from the I/O domain.**
   Execute the ldm remove-io command to delete the virtual function (VF) assigned to the I/O domain from the I/O domain. If multiple VFs are assigned from the physical function (PF) of a single PCIe card, delete all the VFs corresponding to that PF from the I/O domain.

```
# ldm remove-io <VF name> <I/O domain name>
```

4. **Transition the root domain that has the assigned PF to delayed reconfiguration mode.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 5.

```
# ldm start-reconf <root domain name>
```

5. **Discard the virtual function (VF).**
   Execute the ldm destroy-vf command to discard the virtual function (VF). However, the VF needs to be discarded in the reverse order to that in which it was created.

```
# ldm destroy-vf <VF name>
```

6. **Log in to the root domain, and restart Oracle Solaris.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 7.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

3) Releasing the link card or PCIe card using PHP

The following describes the procedure for releasing the link card or PCIe card requiring maintenance from the system using PHP.

Releasing the link card also releases the PCI expansion unit requiring maintenance from the system.

1. **If the link card or PCIe card requiring maintenance belongs to the root domain, connect to the console of the root domain.**
   If it belongs to the control domain, this step is not necessary since the control domain console is being used.
2. **Log in as an Oracle Solaris super-user.**
3. **If the hotplug service has been disabled, execute the svcadm enable hotplug command to enable the hotplug service.**

```
# svcadm enable hotplug
```

4. **Execute the cfgadm -a command to check the Ap_ID of the link card or PCIe card requiring maintenance and make a note of it.**

```
# cfgadm -a
```

5. **Execute the cfgadm -c command to release the link card or PCIe card requiring maintenance from the logical domain.**
   Enter the Ap_ID of the link card or PCIe card that you noted in advance.

```
# cfgadm -c unconfigure Ap_ID
```

6. **Execute the cfgadm -c command to stop the power supply to the link card or PCIe card requiring maintenance.**
   Enter the Ap_ID of the link card or PCIe card that you noted in advance.

```
# cfgadm -c disconnect Ap_ID
```

7. **Execute the cfgadm(1M) command to cause the locator LED of the link card or PCIe card to blink.**
   Enter the Ap_ID of the link card or PCIe card that you noted in advance.

```
# cfgadm -x led=attn, mode=blink Ap_ID
```

8. **If you need to disable the hotplug service, disable the hotplug service.**

```
# svcadm disable hotplug
```

5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)

This section describes the procedure for releasing the physical partition containing the link card from the system using dynamic reconfiguration (DR). The procedure can be performed only for a system with a building block configuration of the SPARC M10-4S.

Note - To use the physical partition dynamic reconfiguration (PPAR DR) function, you need to configure a logical domain beforehand according to "2.5 Dynamic Reconfiguration Conditions and Settings" in the *Fujitsu M10/SPARC M10 Systems Domain Configuration Guide*.

If the PCIe end point of the PCIe card in the chassis requiring maintenance is assigned to an I/O domain or if the SR-IOV virtual function is assigned, return the PCIe end point to the root or control domain. Then, remove the root complex from the root or control domain.

1) Stopping the use of the I/O device

If there is any logical domain that is physically or virtually using the PCIe card mounted in the chassis requiring maintenance, stop the use of the I/O device to keep it unused.

Releasing the I/O device in the case of a redundant configuration

With the duplication function, release the target I/O device so that it will not be used. For details on the work, see the manual for the application being used.

Stop the use of the I/O device in the case of a non-redundant configuration

Place the I/O device in the unused state, such as by deactivating the network or unmounting the disk. For details on the work, see the document of Oracle Solaris or the manual for the application being used.

2) Deleting the assignment of the I/O

In the case that a virtual I/O is used

If the virtual I/O service is used, delete the virtual I/O device. For details, see the *Oracle VM Server for SPARC Administration Guide* released by Oracle.

In the case that the PCIe end point assignment is used

If the PCIe end point device of the chassis requiring maintenance is assigned to an I/O domain, delete the PCIe end point device from the I/O domain and return it to the root domain (including the control domain). The work procedure depends on whether the dynamic reconfiguration function for PCIe end point devices is used. For details, see Table 5-2.

Table 5-4 Differences in the procedures according to whether the dynamic reconfiguration function for PCIe end point devices is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used. (*2)
1	Enabling the hotplug service	svcadm enable hotplug	Perform	Perform (*3)
2	Stopping the I/O domain	ldm stop-domain	-	Perform
3	Deleting the PCIe end point device from the I/O domain	ldm remove-io	Perform	Perform
4	Setting the root domain in delayed reconfiguration mode	ldm start-reconf	-	Perform
5	Assigning the PCIe end point device to the root domain	ldm add-io	Perform	Perform
6	Restarting the root domain	shutdown -i6 -g0 -y	-	Perform
7	Disabling the hotplug service	svcadm disable hotplug	Perform	Perform (*3)

*1 Dynamic reconfiguration for PCIe end point devices is supported by XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.
*2 If dynamic reconfiguration for PCIe end point devices is not used, stop the I/O domain, delete the physical I/O device, and then restore the physical I/O device to the root domain.
*3 If dynamic reconfiguration for PCIe end point devices is not used, the hotplug service operates whether it is enabled or disabled.

Note - Note the following when deleting a physical I/O device (PCIe end point device) of the boot disk:
- If the boot disk is in a redundant configuration, stop the I/O domain for Oracle VM Server for SPARC 3.1.1 or earlier. (For Oracle VM Server for SPARC 3.1.1.1 or later, you do not need to stop the I/O domain.)
- If the boot disk is not in a redundant configuration, stop the I/O domain.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable hotplug command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Stop the I/O domain.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 3.

```
# ldm stop-domain <I/O domain name>
```

3. **Delete the physical I/O device from the I/O domain.**

```
# ldm remove-io <device name> <I/O domain name>
```

4. **Transition the root domain to delayed reconfiguration mode.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 5.

```
# ldm start-reconf <root domain name>
```

5. **Reassign the physical I/O device deleted in step 3 to the root domain.**

```
# ldm add-io <device name> <root domain name>
```

6. **Log in to the root domain, and restart Oracle Solaris.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 7.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

In the case that the virtual function of SR-IOV is used

If the virtual function (VF) using the SR-IOV function has been created for a PCIe card mounted on the PCI expansion unit and it has been assigned to the domain, execute the ldm command from the control domain to delete and discard the virtual function. The work procedure is different for the dynamic SR-IOV function or for static SR-IOV function. For details, see Table 5-3.
For details on the procedure, see the *Oracle VM Server for SPARC Administration Guide* released by Oracle.

Table 5-5 Differences in the releasing procedures between the dynamic SR-IOV function and static SR-IOV function

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function is used. (*1)	Static SR-IOV function is used.
1	Enabling the hotplug service	svcadm enable hotplug	Perform	Perform (*2)
2	Stopping the I/O domain	ldm stop-domain	-	Perform
3	Deleting the VF from the I/O domain	ldm remove-io	Perform	Perform
4	Setting the root domain of the PF in delayed reconfiguration mode	ldm start-reconf	-	Perform
5	Discarding the VF	ldm destroy-vf	Perform	Perform

Table 5-5 Differences in the releasing procedures between the dynamic SR-IOV function and static SR-IOV function *(continued)*

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function is used. (*1)	Static SR-IOV function is used.
6	Restarting the root domain	shutdown -i6 -g0 -y	-	Perform
7	Disabling the hotplug service	svcadm disable hotplug	Perform	Perform (*2)

*1 Dynamic reconfiguration for the virtual function of SR-IOV is supported by XCP 2210 or later and Oracle VM Server for SPARC 3.1 or later.
*2 If static reconfiguration for the virtual function of SR-IOV is used, the hotplug service operates whether it is enabled or disabled.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable hotplug command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Stop the I/O domain.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 3.

```
# ldm stop-domain <I/O domain name>
```

3. **Remove the virtual function (VF) assigned to the I/O domain, from the I/O domain.**
   Execute the ldm remove-io command to delete the virtual function (VF) assigned to the I/O domain from the I/O domain. If multiple VFs are assigned from the physical function (PF) of a single PCIe card, delete all the VFs corresponding to that PF from the I/O domain.

```
# ldm remove-io <VF name> <I/O domain name>
```

4. **Transition the root domain that has the assigned PF to delayed reconfiguration mode.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 5.

```
# ldm start-reconf <root domain name>
```

5. **Discard the virtual function (VF).**
   Execute the ldm destroy-vf command to discard the virtual function (VF). However, the VF needs to be discarded in the reverse order to that in which it was created.

```
# ldm destroy-vf <VF name>
```

6. **Log in to the root domain, and restart Oracle Solaris.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 7.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

3) Removing the root complex

Remove the root complex from the root domain.

If the I/O device of the chassis requiring maintenance is assigned to the root domain, delete the physical I/O device (root complex) from the root domain. The work procedure depends on whether the dynamic reconfiguration function for root complexes is used. For details, see Table 5-6.

Table 5-6 Differences in the procedures according to whether the dynamic reconfiguration function for root complexes is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used. (*2)
1	Stopping the root domain	ldm stop-domain	-	Perform
2	Removing the physical I/O device (root complex) from the root domain	ldm remove-io	Perform	Perform

*1 Dynamic reconfiguration for root complexes is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, Oracle Solaris 11.2 SRU11.2.8 or later must be used for the control domain.
*2 If dynamic reconfiguration for root complexes is not used, stop the root domain, and then remove the physical I/O device.

1. **Stop the root domain.**
   This step is unnecessary if root complexes are dynamically reconfigured. Perform step 2.

```
# ldm stop-domain <root domain name>
```

2. **Remove the physical I/O device (root complex) from the root domain.**

```
# ldm remove-io <physical I/O device name> <root domain name>
```

3. **Confirm that the I/O device of the chassis to be released is unused and unassigned.**

```
# ldm list-io
```

Remove the root complex from the control domain.

If the I/O device of the chassis requiring maintenance is assigned to the control domain, delete the physical I/O device (root complex) from the control domain. The work procedure depends on whether the dynamic reconfiguration function for root complexes is used. For details, see Table 5-7.

Table 5-7 Differences in the procedures according to whether the dynamic reconfiguration function for root complexes is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used. (*2)
1	Setting the control domain in delayed reconfiguration mode	ldm start-reconf	-	Perform
2	Deleting the physical I/O device from the control domain	ldm remove-io	Perform	Perform
3	Restarting the control domain	shutdown -i6 -g0 -y	-	Perform

*1 Dynamic reconfiguration for root complexes is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, Oracle Solaris 11.2 SRU11.2.8 or later must be used for the control domain.
*2 If dynamic reconfiguration for root complexes is not used, set the control domain in delayed reconfiguration mode, and then remove the physical I/O device.

1. **Transition the control domain to delayed reconfiguration mode.**
This step is unnecessary if root complexes are dynamically reconfigured. Perform step 2.

```
# ldm start-reconf <control domain name>
```

2. **Delete the physical I/O device from the control domain.**

```
# ldm remove-io <physical I/O device name> <control domain name>
```

3. **Restart the control domain.**
This step is unnecessary if the dynamic reconfiguration function for root complexes is used.

```
# shutdown -i6 -g0 -y
```

Note - When set to delayed reconfiguration mode, the control domain does not have control over the guest domains. If you have set the control domain to delayed reconfiguration mode, restart the control domain as soon as possible.

4) Releasing the link card using dynamic reconfiguration (DR)

For details on the procedure for dynamic reconfiguration (DR), see "5.4.3 Releasing a chassis requiring maintenance from the physical partition" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*.

5.5.3 Releasing the link card or PCIe card after stopping the system

Cold maintenance of the PCI expansion unit can be performed after stopping the system.
This section describes the procedure for stopping a system to which the PCI expansion unit is connected.
For details on the procedure, see "5.6 Stopping the Entire System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or "5.5 Stopping the Entire System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*.

Stopping the system with the XSCF command

1. **Confirm that the mode switch on the operation panel is in Service mode.**
2. **Log in to the XSCF shell.**
3. **Execute the poweroff command.**
4. **Check that the POWER LED on the operation panel is off.**
5. **Execute the showpparstatus command to confirm that the power to the physical partition is turned off.**
6. **Execute the showdomainstatus command to confirm the operating condition of the logical domain.**

Stopping the system from the operation panel

1. **Confirm that the mode switch on the operation panel is in Service mode.**
2. **Press the power switch on the operation panel for 4 seconds or more.**
3. **Check that the POWER LED on the operation panel is off.**
4. **Execute the showpparstatus command to confirm that the power to the**

physical partition is turned off.

5. **Execute the showdomainstatus command to confirm the operating condition of the logical domain.**

5.6 Stopping the FRU Requiring Maintenance

This section describes the procedure for stopping the power supply to the FRU requiring maintenance using the ioxadm command.

1. **Log in to the XSCF shell.**
2. **Execute the ioxadm command to stop the FRU requiring maintenance.**
   In the following example, PSU#0 of PCIBOX#2007 is specified to stop the corresponding PSU.

```
XSCF> ioxadm poweroff PCIBOX#2007/PSU#0
```

   In the following example, FAN#0 of PCIBOX#2007 is specified to stop the corresponding fan unit.

```
XSCF> ioxadm poweroff PCIBOX#2007/FAN#0
```

3. **Confirm that the CHECK LED of the FRU requiring maintenance blinks.**

5.7 Accessing an FRU

This section describes the operations to be performed before accessing the FRU requiring maintenance.

5.7.1 Lowering the cable support

To perform maintenance on any of the following components on the rear of or inside the chassis, lower the cable support before performing the work.

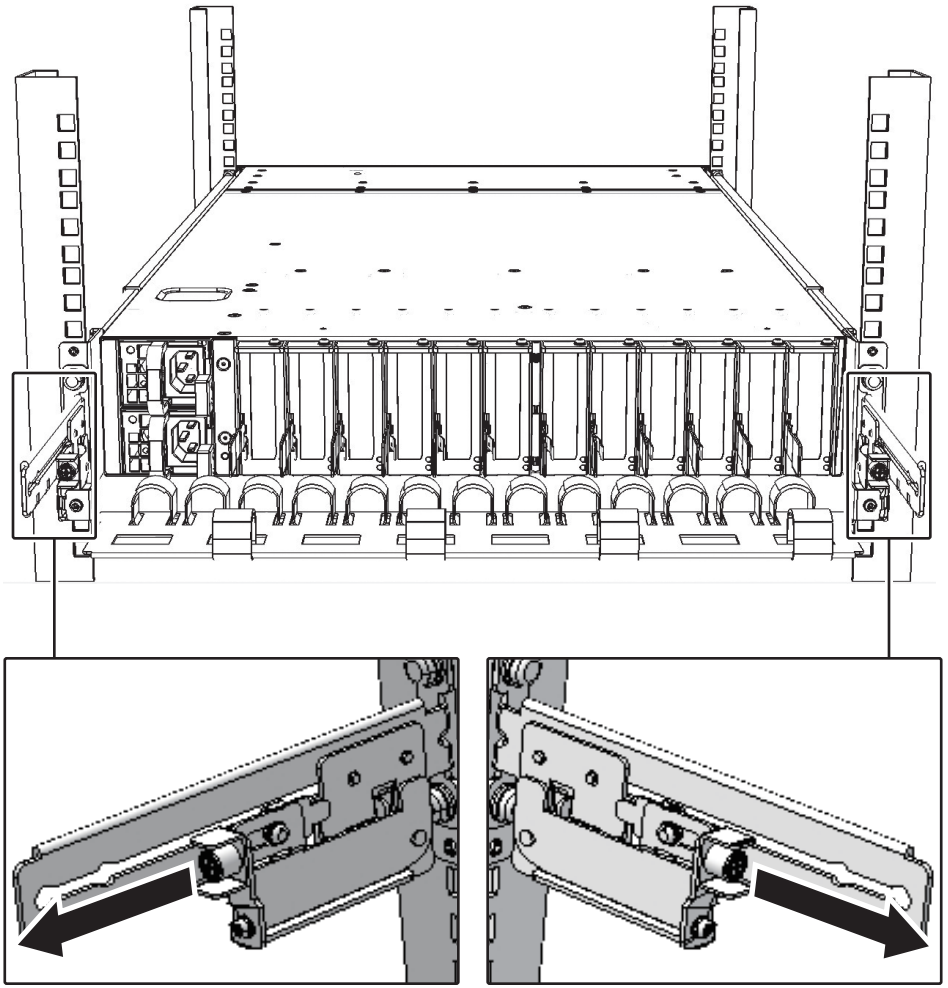
- PCI Express card
- Link board
- Power supply unit
- PCI tray
- I/O board

Note - There are two types of cable supports. Distinguish them by the locations of the screws fixing the cable support. For details on the locations of the screws, see Figure 5-1 and Figure 5-2.

Lowering the cable support

1. **Loosen the right and left screws fixing the cable support, and unlock it by pulling the upper and lower metal fittings towards you (in the direction of the arrow).**

Figure 5-1 Locations of screws holding the cable support

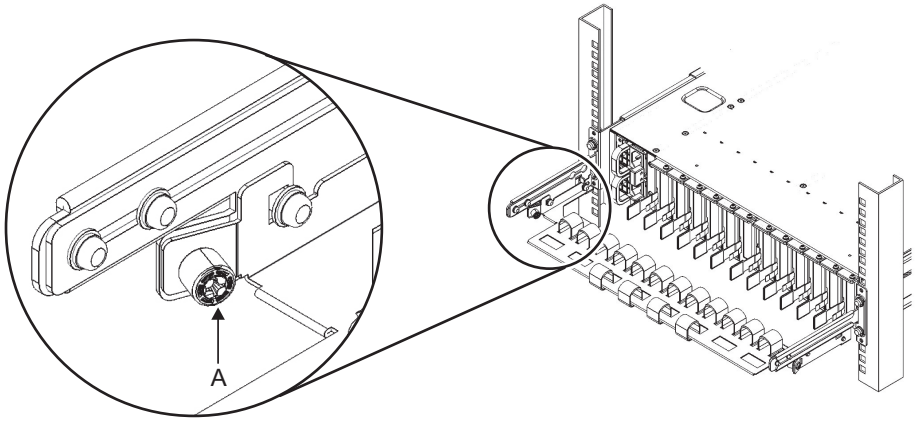


2. **Lower the cable support.**

Lowering the cable support (if it is a new model)

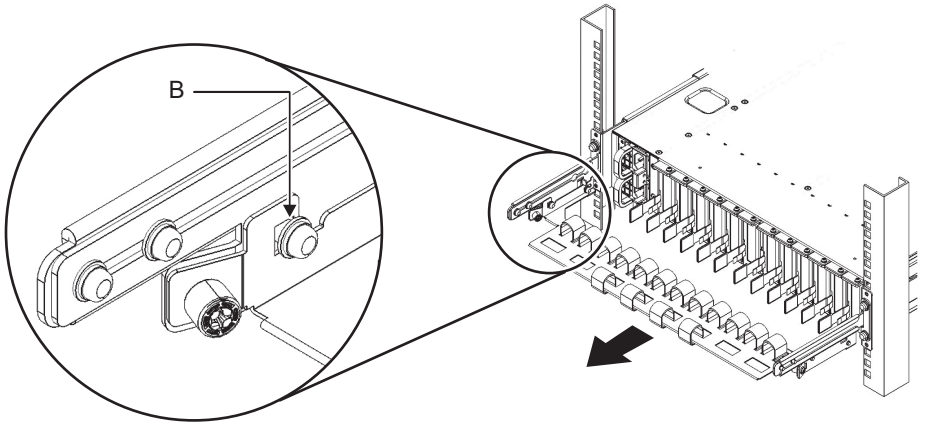
1. **Loosen the right and left screws (A in Figure 5-2) fixing the cable support.**

Figure 5-2 Locations of screws holding the cable support



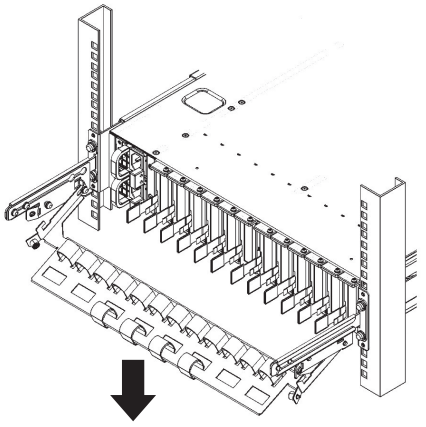
2. **Lift the cable support to release the hooks (B in Figure 5-3), and pull it out.**

Figure 5-3 Releasing the cable support



3. **Lower the cable support.**

Figure 5-4 Handling the cable support

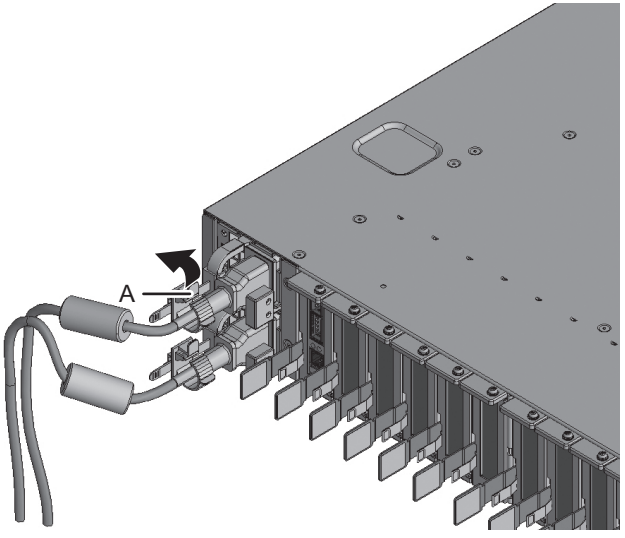


5.7.2 Removing the power cord

Remove the cable clamp from each power cord, and then remove the power cords.

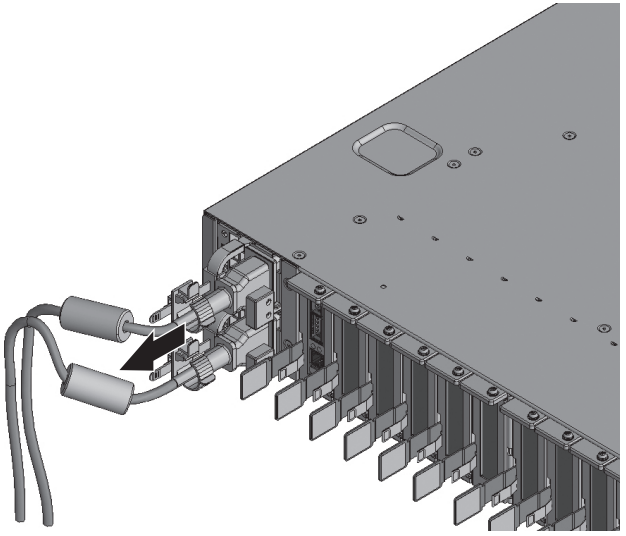
1. **Release the latch (A in the figure) of the cable clamp.**
   Pulling the cable clamp toward the rear of the chassis facilitates the release of the latch.

Figure 5-5 Removing the cable clamp



2. **Remove the power cord from the power supply unit.**

Figure 5-6 Removing the power cords



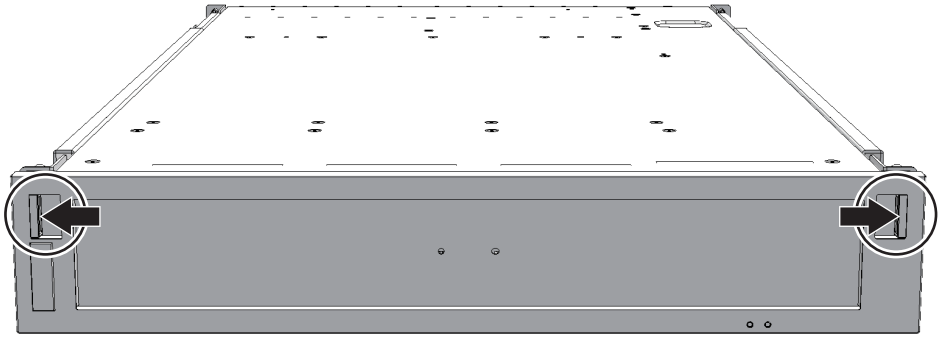
5.7.3 Removing the front cover

To perform maintenance on any of the following components on the front panel or inside the chassis, remove the front cover.

- Fan unit
- PCI tray
- I/O board

1. **Release the slide locks on both the left and right sides of the front cover, and then remove the front cover.**

Figure 5-7 Removing the front cover



Chapter 6

Understanding the Preparations for Restoring the System

This chapter describes the procedures for restoring the system after component maintenance. See this chapter, as required, when performing the maintenance work on each component described in Chapter 7 onwards.

- Restoring the Chassis of the PCI Expansion Unit
- Supplying Power to the FRU Requiring Maintenance
- Mounting a Link Card or PCIe Card on the System
- Restoring the Logical Domain to the Status It Had before Maintenance
- Turning off the CHECK LED (Locator) of the PCI Expansion Unit
- Updating the Firmware of the PCI Expansion Unit

6.1 Restoring the Chassis of the PCI Expansion Unit

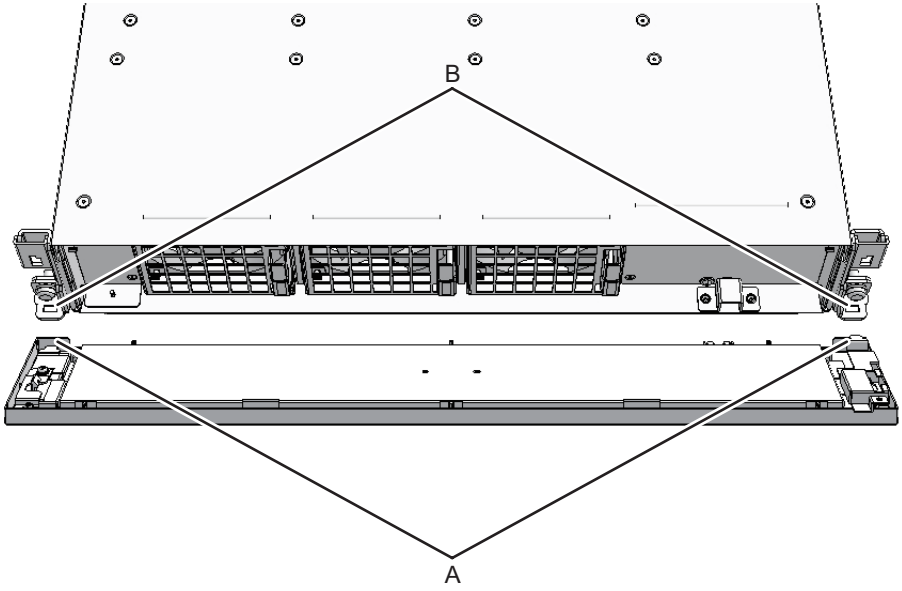
This section describes how to restore the chassis of the PCI expansion unit. The procedure for restoring a chassis depends on the components that have been maintained.

6.1.1 Installing the front cover

If the front cover has been removed for maintenance, mount the components on the front panel or inside the chassis, and then reinstall the front cover.

1. **Insert the tabs of the front cover (A in the figure) into the notches located on the lower side of the front panel of the chassis (B in the figure) to install the front cover.**

Figure 6-1 Installing the front cover

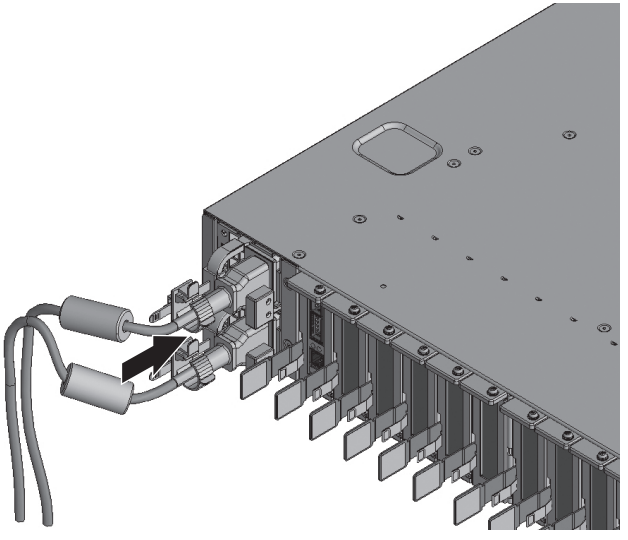


6.1.2 Installing the power cords

If the power cords were removed to perform maintenance, reinstall the power cords in the PCI expansion unit, and then secure them with the cable clamp.

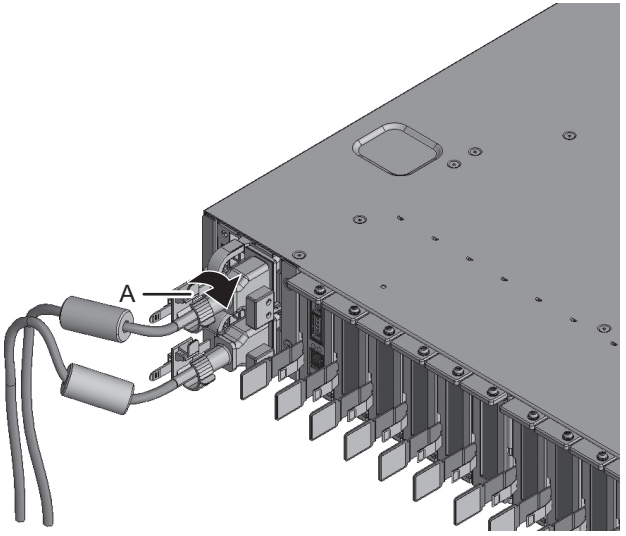
1. **Install the power cords to the power supply unit of the PCI expansion unit.**

Figure 6-2 Installing the power cords



2. **Clip the power cords with the cable clamp, and secure the cable clamp.**
   Lock the latch (A in the figure) and then push the cable clamp toward the front of the chassis to firmly secure the cable clamp.

Figure 6-3 Locking the cable clamp



6.1.3 Fixing the cable support

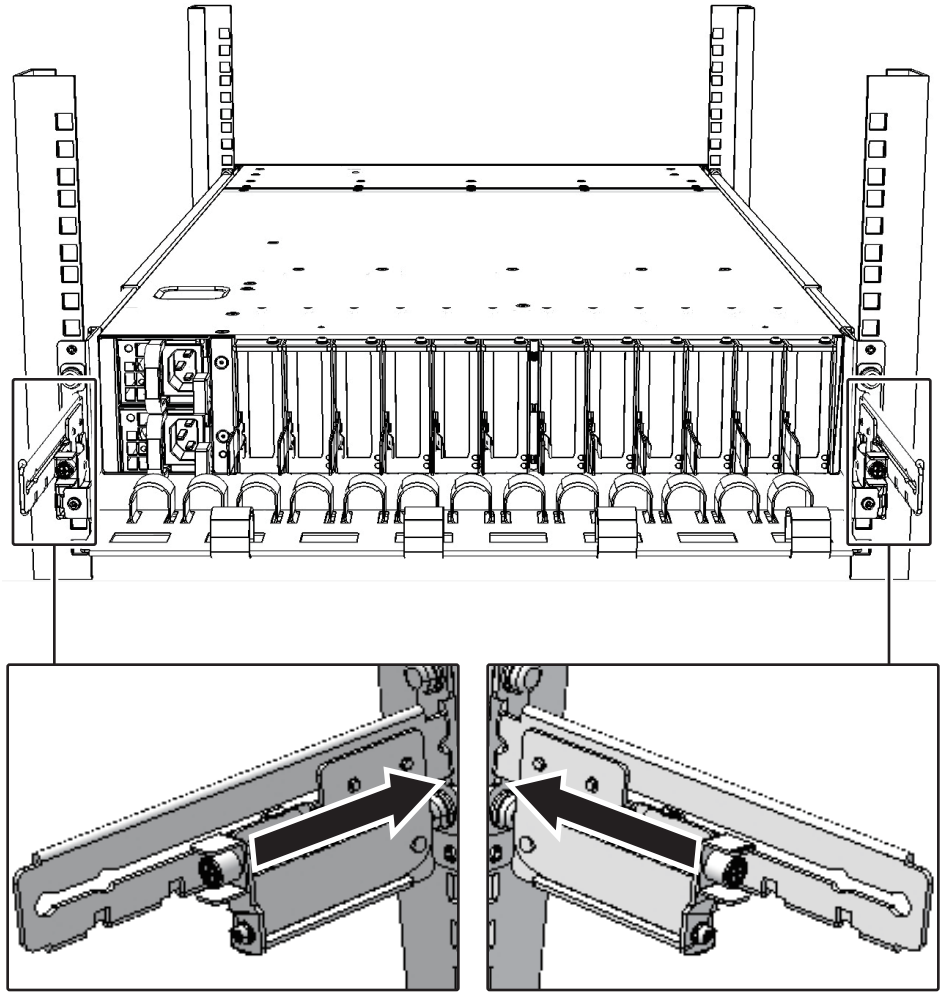
If the cable support was lowered to perform maintenance, lift the cable support and fix it in place.

Note - There are two types of cable supports. Distinguish them by the locations of the screws fixing the cable support. For details on the locations of the screws, see Figure 5-1 and Figure 5-2.

Fixing the cable support

1. **Lift the cable support and lock it in place by pushing the upper and lower screw fittings toward the back (direction of the arrow).**

Figure 6-4 Locking the cable support



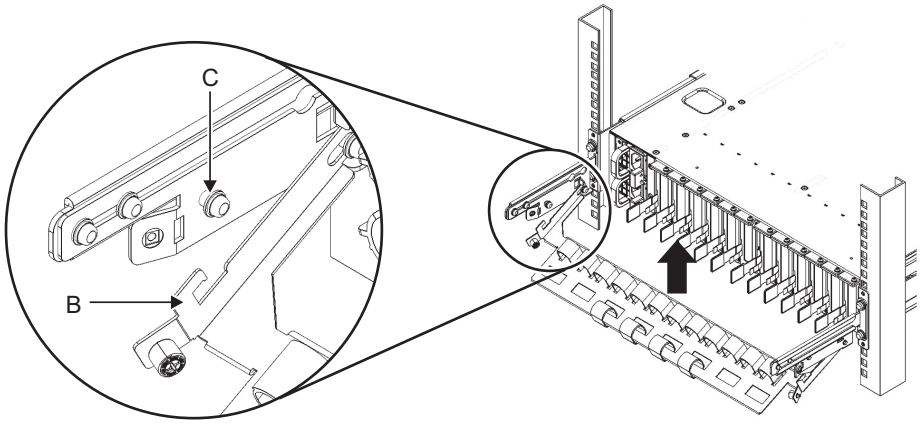
2. **Tighten the right and left screws to fix the cable support in place.**

Note - Check that the cable support is firmly attached and fixed.

Fixing the cable support (if it is a new model)

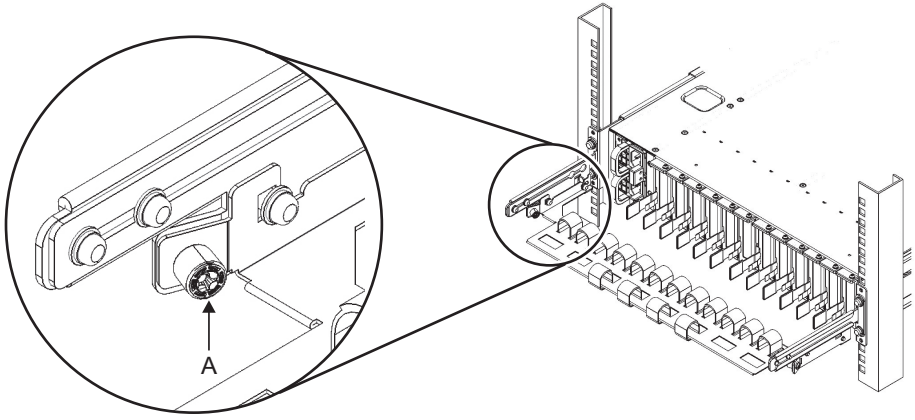
1. **Lift the cable support and fasten the hooks (B in Figure 6-5) on the screws (C in Figure 6-5).**

Figure 6-5 Handling the cable support



2. **Tighten the right and left screws (A in Figure 6-6) to fix the cable support in place.**

Figure 6-6 Locking the cable support



6.2 Supplying Power to the FRU Requiring Maintenance

This section describes the procedure for supplying power to the FRU requiring maintenance using the ioxadm command.

1. **Log in to the XSCF shell.**
2. **Execute the ioxadm command to supply power to the FRU requiring**

maintenance.
In the following example, PSU#0 of PCIBOX#12B4 is specified.

```
XSCF> ioxadm poweron PCIBOX#12B4/PSU#0
```

In the following example, FAN#0 of PCIBOX#12B4 is specified.

```
XSCF> ioxadm poweron PCIBOX#12B4/FAN#0
```

6.3 Mounting a Link Card or PCIe Card on the System

This section describes the procedure for mounting a link card or a PCIe card of the PCI expansion unit on the system.
The card is mounted on the system using either of the following methods: Using PCI hot plug (PHP) and using physical partition dynamic reconfiguration (DR).

Note - The link card is mounted in the PCI Express (PCIe) slot of the SPARC M10-1 or SPARC M10-4/M10-4S. The procedure for installing the link card is the same as that for installing a PCIe card to be mounted on the SPARC M10-1 or SPARC M10-4/M10-4S. For details on the SPARC M10-1, see "8.3 Removing a PCI Express Card" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*. For details on the SPARC M10-4/M10-4S, see "8.4 Removing a PCI Express Card" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*.

6.3.1 Mounting a link card using PCI hot plug (PHP)

This section describes the procedure for mounting a link card on the server using PCI hot plug (PHP).

For details on the cfgadm(1M) command used here, see "2. Dynamically Configuring Devices" in the *Managing Devices in Oracle Solaris 11.2*. In the case of Oracle Solaris 10, see "SCSI Hot-Plugging With the cfgadm Command (Task Map)" in the *Oracle Solaris Administration: Devices and File Systems*.

Note - If you use PCI hot plug (PHP) to mount the link card on the server, pull all the PCIe cassettes containing PCIe cards out of the PCI expansion unit in advance. Mount the link card on the server before installing the pulled-out PCIe cassettes in the PCI expansion unit. Then, use PHP to incorporate them into the server.

---

1. **Log in as an Oracle Solaris super-user.**

2. **Execute the svcadm enable hotplug command to activate the hotplug service.**

```
# svcadm enable hotplug
```

3. **Execute the cfgadm(1) command to mount the link card to which the PCI expansion unit is connected on the logical domain.**
   For the Ap_ID, enter the Ap_ID of the link card you noted down before the start of maintenance.

Note - For link card maintenance in an environment on Oracle Solaris 11.2 or later, the link card is automatically incorporated on the server simply by mounting it on the server. Therefore, you do not need to perform an operation to incorporate the link card using the cfgadm command.

```
# cfgadm -c configure Ap_ID
```

4. **If you have replaced a link card or I/O board, match the firmware version with the one before replacement.**
   a. Check the firmware version of the PCI expansion unit. For details, see "Check method when the system has been started" in "6.6.1 How to check the serial number and firmware version of the PCI expansion unit."

      If the firmware version is the same as the one before replacement, go to step 5.

   b. If the firmware version is different from the one before replacement, match it with the one before replacement . See "6.6.4 Updating the firmware" for details to perform work up to step 3.

   c. To reflect the firmware, release the link card using PHP.

```
# cfgadm -c disconnect Ap_ID
```

   d. Execute the cfgadm(1M) command to incorporate the link card into the logical domain.

```
# cfgadm -c configure Ap_ID
```

   e. Confirm that the firmware version is now the same as the one before replacement. For details, see "Check method when the system has been started" in "6.6.1 How to check the serial number and firmware version of the PCI expansion unit."

5. **Install all the PCIe card cassettes into the PCI expansion unit.**
   Lower the lever while pressing the latch of the PCIe card cassette to secure it.

6. **Execute the cfgadm(1M) command to supply power to the PCIe card.**
   Enter the Ap_ID of the PCIe card that was checked in step 6.

```
# cfgadm -c connect Ap_ID
```

7. **Execute the cfgadm(1M) command to incorporate the PCIe card into the logical domain.**
   For the Ap_ID, enter the Ap_ID of the link card you noted down before the start of maintenance.

```
# cfgadm -c configure Ap_ID
```

8. **Execute the cfgadm(1M) command to confirm that the PCIe card requiring maintenance has been incorporated into the logical domain.**
   In the following example, the [Receptacle] is displayed as "connected" and the [Occupant] as "configured," indicating that the PCIe card requiring maintenance is incorporated into the logical domain.

```
# cfgadm -a
Ap_Id                          Type         Receptacle     Occupant
Condition
BB#0-PCI#0:iobE7a77.pcie4      etherne/hp   connected      configured     ok
```

9. **If you have released the I/O device assigned to an I/O domain before maintenance, restore the physical I/O device (PCIe end point device) to its original status.**
   For details, see "6.4.3 Work to return the physical I/O device to the I/O domain."
10. **Suppose that the virtual function (VF) using the SR-IOV function has been deleted or discarded before maintenance. Based on the retained output result of the idm list-io command, re-perform the virtual function creation and assignment to the domain.**
    For details, see "6.4.4 Work to restore the SR-IOV function."
11. **If a virtual device (vnet, vdisk) of a guest domain has been kept unused before maintenance, return it to its original status.**
    For details, see "6.4.5 Work to restore a virtual device."
12. **If you have enabled the hotplug service, execute the svcadm command to disable the hotplug service.**

```
# svcadm disable hotplug
```

6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)

This section describes the procedure for mounting the link card on the server using physical partition dynamic reconfiguration (DR).
For details, see "6.5.1 Incorporating a chassis into a physical partition" in the *Fujitsu*

Note - For Oracle VM Server for SPARC 3.2 or later, to mount the link card on the server, pull all the PCIe cassettes containing PCIe cards out of the PCI expansion unit in advance. Mount the link card on the server before installing the pulled-out PCIe cassettes in the PCI expansion unit. Then, use PHP for the PCIe cards in the PCI expansion unit to incorporate them into server.

1. **Log in to the XSCF shell.**
2. **Execute the addboard command with the -c configure option specified to incorporate the target chassis into the physical partition.**
   Enter "y" in response to the confirmation message.

   The following example mounts PSB 00-0 on PPAR-ID.

```
XSCF> addboard -c configure -p 0 00-0
```

3. **Execute the showresult command to check the end status of the addboard command that has just been executed.**
   The following example shows that "0" is returned as the end status and the execution of the addboard command has been completed successfully.

```
XSCF> showresult
0
```

4. **Execute the showboards command to confirm that the chassis requiring maintenance has been incorporated into the physical partition.**
   The BB-ID of the server requiring maintenance is indicated by the system board (PSB) number.

```
XSCF> showboards -a
```

5. **Execute the showstatus command to confirm that the FRU is operating normally after the completion of maintenance.**
   Nothing is displayed if it is normal.

```
XSCF> showstatus
```

6. **Execute the showhardconf command to check the hardware configuration and the status of each FRU.**
   Confirm that no asterisk (*) is displayed in front of any FRU.

```
XSCF> showhardconf
```

7. **If the state of the master chassis requiring maintenance has been switched to the standby state before maintenance, execute the switchscf command to**

switch the chassis to the master XSCF.

```
XSCF> switchscf -t Standby
```

8. **Add the root complex that was deleted from the control domain before maintenance.**
   For details, see "6.4.1 Returning the root complex to the control domain."
9. **Start the root domain to which the root complex was assigned before maintenance from the unbind state.**
   For details, see "6.4.2 Work for returning the root complex to the root domain."
10. **If you have replaced a link card or I/O board, match the firmware version with the one before replacement.**
    a. Check the firmware version of the PCI expansion unit. For details, see "Check method when the system has been started" in "6.6.1 How to check the serial number and firmware version of the PCI expansion unit."

       If the firmware version is the same as the one before replacement, go to step 11.

    b. If the firmware version is different from the one before replacement, match it with the one before replacement . See "6.6.4 Updating the firmware" for details to perform work up to step 3.

    c. To reflect the firmware, log in to the root domain, and restart Oracle Solaris.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

    d. Confirm that the firmware version is now the same as the one before replacement. For details, see "Check method when the system has been started" in "6.6.1 How to check the serial number and firmware version of the PCI expansion unit."
11. **Install all the PCIe card cassettes into the PCI expansion unit.**
    Lower the lever while pressing the latch of the PCIe card cassette to secure it.
12. **Execute the svcadm enable hotplug command to activate the hotplug service.**

```
# svcadm enable hotplug
```

13. **Execute the cfgadm(1M) command to supply power to the PCIe card.**
    Enter the Ap_ID of the PCIe card that was checked in step 6.

```
# cfgadm -c connect Ap_ID
```

14. **Execute the cfgadm(1M) command to incorporate the PCIe card into the logical domain.**
    For the Ap_ID, enter the Ap_ID of the link card you noted down before the start

of maintenance.

```
# cfgadm -c configure Ap_ID
```

15. **Execute the cfgadm(1M) command to confirm that the PCIe card requiring maintenance has been incorporated into the logical domain.**
    In the following example, the [Receptacle] is displayed as "connected" and the [Occupant] as "configured," indicating that the PCIe card requiring maintenance is incorporated into the logical domain.

```
# cfgadm -a
Ap_Id                          Type         Receptacle     Occupant
Condition
BB#0-PCI#0:iobE7a77.pcie4      etherne/hp   connected      configured     ok
```

16. **If you have released the I/O device assigned to an I/O domain before maintenance, restore the physical I/O device (PCIe end point device) to its original status.**
    For details, see "6.4.3 Work to return the physical I/O device to the I/O domain."
17. **Suppose that the virtual function (VF) using the SR-IOV function has been deleted or discarded before maintenance. Based on the retained output result of the idm list-io command, re-perform the virtual function creation and assignment to the domain.**
    For details, see "6.4.4 Work to restore the SR-IOV function."
18. **If a virtual device (vnet, vdisk) of a guest domain has been kept unused before maintenance, return it to its original status.**
    For details, see "6.4.5 Work to restore a virtual device."

6.3.3 Mounting a PCIe card on the server using PCI hot plug (PHP)

This section describes the procedure for mounting a PCIe card on the server using PCI hot plug (PHP).

For details on the cfgadm(1M) command used here, see "2. Dynamically Configuring Devices" in the *Managing Devices in Oracle Solaris 11.2*. In the case of Oracle Solaris 10, see "SCSI Hot-Plugging With the cfgadm Command (Task Map)" in the *Oracle Solaris Administration: Devices and File Systems*.

Note - To perform PCIe card maintenance using the hot plug function, confirm that the card is PHP enabled. To do so, check "Appendix A Cards that Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.

Mount the PCI Express card in the target PCI slot. Then, incorporate it into a logical domain in the following procedure.

1. **Log in as an Oracle Solaris super-user.**

2. **Execute the svcadm enable hotplug command to activate the hotplug service.**

```
# svcadm enable hotplug
```

3. **Execute the cfgadm(1M) command to check the mounting position Ap_Id of the target PCIe card.**

```
# cfgadm -a
```

4. **Execute the cfgadm(1M) command to supply power to the PCIe card.**
   Enter the Ap_ID of the PCIe card that you noted in advance.

```
# cfgadm -c connect Ap_ID
```

5. **Execute the cfgadm(1M) command to incorporate the PCIe card into the logical domain.**
   For the Ap_ID, enter the Ap_ID of the link card you noted down before the start of maintenance.

```
# cfgadm -c configure Ap_ID
```

6. **Execute the cfgadm(1M) command to confirm that the PCIe card requiring maintenance has been incorporated into the logical domain.**
   In the following example, the [Receptacle] is displayed as "connected" and the [Occupant] as "configured," indicating that the PCIe card requiring maintenance is incorporated into the logical domain.

```
# cfgadm -a
Ap_Id                          Type         Receptacle     Occupant
Condition
BB#0-PCI#0:iobE7a77.pcie4      etherne/hp   connected      configured     ok
```

7. **Assign the I/O device of the incorporated PCIe card to the logical domain.**
   a. **If you have released the I/O device assigned to an I/O domain before maintenance, restore the physical I/O device (PCIe end point device) to its original status.**

      For details, see "6.4.3 Work to return the physical I/O device to the I/O domain."

   b. **Suppose that the virtual function (VF) using the SR-IOV function has been deleted or discarded before maintenance. Based on the retained output result of the idm list-io command, re-perform the virtual function creation and assignment to the domain.**

      For details, see "6.4.4 Work to restore the SR-IOV function."

   c. **If a virtual device (vnet, vdisk) of a guest domain has been kept unused before maintenance, return it to its original status.**

For details, see "6.4.5 Work to restore a virtual device."

8. **If you have added a new PCI Express card, see the following manual to perform appropriate operations:**
   - In the case that dynamic reconfiguration for PCIe end point devices is used

     "15.3.1 Adding a physical I/O device to an I/O domain" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*

Note - Dynamic reconfiguration for PCIe end point devices is supported by XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.

   - In the case that dynamic reconfiguration for PCIe end point devices is not used

     "3.2.15 Configuring an I/O device" and "3.2.16 Creating or destroying the SR-IOV virtual function" in the *Fujitsu M10/SPARC M10 Systems Domain Configuration Guide*

9. **If you have enabled the hotplug service, execute the svcadm command to disable the hotplug service.**

```
# svcadm disable hotplug
```

6.4 Restoring the Logical Domain to the Status It Had before Maintenance

This section describes the flow of work in restoring a logical domain after FRU maintenance to the pre-maintenance state. For details on the work and the commands used, see "3.2 Operations and Commands Related to Logical Domain Configurations" in the *Fujitsu M10/SPARC M10 Systems Domain Configuration Guide* and *Oracle VM Server for SPARC Reference Manual* for the version being used.

The following procedure returns a logical domain to the state in the ldm list-io output results that were checked in step 4 in "5.4.2 Checking the assignment status of I/O devices."

6.4.1 Returning the root complex to the control domain

Return the root complex released from the control domain to the control domain.

Table 6-1 Differences in the procedures according to whether the dynamic reconfiguration function for root complexes is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used. (*2)
1	Setting the control domain in delayed reconfiguration mode	ldm start-reconf	-	Perform
2	Assigning the physical I/O device to the control domain	ldm add-io	Perform	Perform
3	Restarting the control domain	shutdown -i6 -g0 -y	-	Perform

*1 Dynamic reconfiguration for root complexes is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, Oracle Solaris 11.2 SRU11.2.8 or later must be used for the control domain.
*2 If dynamic reconfiguration for root complexes is not used, set the control domain in delayed reconfiguration mode, and then assign the physical I/O device.

1. **Log in to Oracle Solaris on the control domain of the physical partition.**
2. **Transition the control domain to delayed reconfiguration mode.**
   This step is unnecessary if root complexes are dynamically reconfigured. Perform step 3.

```
# ldm start-reconf <control domain name>
```

3. **Reassign the physical I/O device to the control domain.**

```
# ldm add-io <physical I/O device name> <control domain name>
```

4. **Restart Oracle Solaris on the control domain.**
   This step is unnecessary if the dynamic reconfiguration function for root complexes is used.

```
# shutdown -i6 -g0 -y
```

Note - When set to delayed reconfiguration mode, the control domain does not have control over the guest domains. If you have set the control domain to delayed reconfiguration mode, restart the control domain as soon as possible.

6.4.2 Work for returning the root complex to the root domain

Return the physical I/O device (root complex) released from the root domain to the root domain.

Table 6-2 Differences in the procedures according to whether the dynamic reconfiguration function for root complexes is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used. (*2)
1	Assigning the physical I/O device (root complex) to the root domain	ldm add-io	Perform	Perform
2	Starting the root domain	ldm start-domain	-	Perform

*1 Dynamic reconfiguration for root complexes is supported by XCP 2240 or later and Oracle VM Server for SPARC 3.2 or later. In addition, Oracle Solaris 11.2 SRU11.2.8 or later must be used for the control domain.
*2 If dynamic reconfiguration for root complexes is not used, assign the physical I/O device (root complex), and then start the root domain.

1. **Reassign the I/O device (root complex) released from the root domain to the root domain.**

```
# ldm add-io <physical I/O device name> <root domain name>
```

2. **Start the root domain.**
   This step is unnecessary if the dynamic reconfiguration function for root complexes is used.

```
# ldm start-domain <root domain name>
```

6.4.3 Work to return the physical I/O device to the I/O domain

If you released the I/O device assigned to an I/O domain before maintenance according to "2) Deleting the assignment of the I/O" of "5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)" or "5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)," restore the physical I/O device (PCIe end point device) to its original status.
The PCIe slot is automatically assigned to the root domain. So, to reassign it to the I/O domain, first release it from the root domain and then assign it.

Table 6-3 Differences in the procedures according to whether the dynamic reconfiguration function for PCIe end point devices is used

-: Unnecessary

Item	Task	Command	Dynamic reconfiguration is used. (*1)	Dynamic reconfiguration is not used.
1	Enabling the hotplug service	svcadm enable hotplug	Perform	Perform (*2)
2	Setting the root domain in delayed reconfiguration mode	ldm start-reconf	-	Perform
3	Deleting the physical I/O from the root domain	ldm remove-io	Perform	Perform
4	Restarting the root domain	shutdown -i6 -g0 -y	-	Perform
5	Assigning the physical I/O to the root domain	ldm add-io	Perform	Perform
6	Starting the I/O domain	ldm start-domain	-	Perform
7	Disabling the hotplug service	svcadm disable hotplug	Perform	Perform (*2)

*1 Dynamic reconfiguration for PCIe end point devices is supported by XCP 2230 or later and Oracle VM Server for SPARC 3.1.1.1 or later.
*2 If dynamic reconfiguration for PCIe end point devices is not used, the hotplug service operates whether it is enabled or disabled.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable hotplug command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Transition the root domain to delayed reconfiguration mode.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 5.

```
# ldm start-reconf <root domain name>
```

3. **Delete the physical I/O device from the root domain.**

```
# ldm remove-io <device name> <root domain name>
```

4. **Log in to the root domain, and restart Oracle Solaris on the root domain.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 5.

```
# telnet localhost <port number>
...
# shutdown -i6 -g0 -y
```

5. **Assign the physical I/O device to the I/O domain.**

```
# ldm add-io <device name> <I/O domain name>
```

6. **Start the I/O domain.**
   This step is unnecessary if the dynamic reconfiguration function for PCIe end point devices is used. Perform step 7.

```
# ldm start <I/O domain name>
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

6.4.4 Work to restore the SR-IOV function

If the SR-IOV function was used to remove and discard a virtual function (VF) before maintenance according to "2) Deleting the assignment of the I/O" of "5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)" or "2) Deleting the assignment of the I/O" of "5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)," create the virtual function again and assign it to the domain based on the retained output data from the ldm list-io command.

Table 6-4 Differences in the releasing procedures between the dynamic SR-IOV function and static SR-IOV function

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function is used. (*1)	Static SR-IOV function function is used.
1	Enabling the hotplug service	svcadm enable hotplug	Perform	Perform (*2)
2	Setting the root domain of the PF in delayed reconfiguration mode	ldm start-reconf	-	Perform
3	Creating the VF	ldm create-vf	Perform	Perform
4	Assigning the VF to the I/O domain	ldm add-io	Perform	Perform
5	Restarting the root domain	shutdown -i6 -g0 -y	-	Perform
6	Starting the I/O domain	start-domain	-	Perform

Table 6-4 Differences in the releasing procedures between the dynamic SR-IOV function and static SR-IOV function *(continued)*

-: Unnecessary

Item	Task	Command	Dynamic SR-IOV function is used. (*1)	Static SR-IOV function function is used.
7	Disabling the hotplug service	svcadm disable hotplug	Perform	Perform (*2)

*1 Dynamic reconfiguration for the virtual function of SR-IOV is supported by XCP 2210 or later and Oracle VM Server for SPARC 3.1 or later.
*2 If static reconfiguration for the virtual function of SR-IOV is used, the hotplug service operates whether it is enabled or disabled.

1. **If the hotplug service is disabled for the I/O and root domains, execute the svcadm enable hotplug command to enable the hotplug service.**

```
# svcadm enable hotplug
```

2. **Transition the root domain that has the assigned physical function (PF) to delayed reconfiguration mode.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 3.

```
# ldm start-reconf <root domain name>
```

3. **Create the virtual function.**

```
# ldm create-vf <PF name>
```

4. **Assign the virtual function (VF) to the I/O domain.**

```
# ldm add-io <VF name> <I/O domain name>
```

5. **Log in to the root domain, and restart Oracle Solaris.**
   This step is unnecessary if the dynamic SR-IOV function is used. Perform step 7.

```
# telnet localhost <port name>
...
# shutdown -i6 -g0 -y
```

6. **Start the I/O domain.**

```
# ldm start <I/O domain name>
```

7. **If you need to disable the hotplug service for the I/O and root domains, disable the hotplug service.**

```
# svcadm disable hotplug
```

8. **If virtual devices of a guest domain have been kept unused or the redundant configuration was released in "5.4.1 Releasing the assignment of I/O devices," resume the use of the virtual devices or set the redundant configuration again.**
   For details on the work, see the manual for the application being used.
9. **Confirm that the status of the physical I/O device is the same as before maintenance.**

```
# ldm list-io
```

10. **Confirm that the operating condition of the logical domain remains unchanged.**

```
# ldm list-domain
```

6.4.5 Work to restore a virtual device

If a virtual device (vnet, vdisk) of a guest domain has been kept unused before maintenance, return it to its original status.

1. **If virtual devices of a guest domain have been kept unused or the redundant configuration was released, resume the use of the virtual devices or set the redundant configuration again.**
   For details on the work, see the manual for the application being used.
2. **Confirm that the status of the physical I/O device is the same as before maintenance.**

```
# ldm list-io
```

3. **Confirm that the operating condition of the logical domain remains unchanged.**

```
# ldm list-domain
```

6.5 Turning off the CHECK LED (Locator) of the PCI Expansion Unit

This section describes the procedure for turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance.

1. **Log in to the XSCF shell.**
2. **Execute the ioxadm locator command, and confirm that the CHECK LED (locator) of the PCI expansion unit requiring maintenance is turned off.**
   In the following example, the CHECK LED of PCIBOX#12B4 is specified.

```
XSCF> ioxadm locator off PCIBOX#12B4
```

6.6 Updating the Firmware of the PCI Expansion Unit

This section describes the precautions to be observed when updating and the method of checking the firmware version.

6.6.1 How to check the serial number and firmware version of the PCI expansion unit

The largest firmware version number indicates the latest firmware. Check the current firmware version before starting update.
The procedures will be different for maintenance with the system stopped or for active maintenance.

Check method when the system is stopped

1. **Switch the mode switches for the master chassis and those chassis whose XSCFs are in the standby state to Service mode.**
   - For the SPARC M10-1/M10-4
     This is always the master chassis since it has a single-unit configuration.
   - For a building block configuration (no crossbar box)
     Change the mode switches of BB-ID#00 and #01 to Service mode.
   - For a building block configuration (with crossbar boxes)
     Change the mode switches of BB-ID#80 and #81 to Service mode.
2. **Log in to the XSCF shell of the master chassis.**

- For the SPARC M10-1/M10-4
  This is always the master chassis since it has a single-unit configuration.
- For the SPARC M10-4S (no crossbar box)
  The master chassis is the chassis where the BB-ID#00 or #01 MASTER LED (green) at the rear of the chassis is on.
- For the SPARC M10-4S (with crossbar boxes)
  The master chassis is the chassis where the BB-ID#80 or #81 MASTER LED (green) at the rear of the chassis is on.

3. **Execute the setpparparam command, and disable the Auto boot function of the physical partition.**
   In the following example, PPAR-ID 0 is set for Auto boot.

   If Auto boot is disabled for the physical partition, go to step 4.

```
XSCF> setpparparam -p 0 -s bootscript "setenv auto-boot? false"
```

4. **Execute the poweron command to start the system.**
   For a building block configuration, specify the physical partition connected to the PCI expansion unit, and start the system.

   In the following example, PPAR-ID 0 is specified.

```
XSCF> poweron -p 0
```

5. **If multiple PCI expansion units are connected, execute the ioxadm list command to check the combination of the link card and the I/O board.**

```
XSCF> ioxadm list
PCIBOX       Link
PCIBOX#2007  BB#00-PCI#10
PCIBOX#2006  BB#00-PCI#09
PCIBOX#2005  BB#00-PCI#08
PCIBOX#2004  BB#00-PCI#07
```

6. **Execute the ioxadm -v list command to check the serial number and the firmware version of the PCI expansion unit.**
   [Location] displays the last four digits of the serial number of the PCI expansion unit, and [FW Ver] displays the firmware version of the link card ("CARD" shown on [Type]) and that of the I/O board ("IOBOARD" shown on [Type]).

   The following example shows that "2007" is the last four digits of the serial number of the PCI expansion unit and "1080" is the firmware version of the link card and the I/O board.

```
XSCF> ioxadm -v list
Location           Type    FW Ver  Serial Num           Part Num           State
PCIBOX#2007         PCIBOX   -      PZ21242007                                On
PCIBOX#2007/PSU#0  PSU      -      FEJD1212000521 CA01022-0750-D/7060988     On
PCIBOX#2007/PSU#1  PSU      -      FEJD1201000738 CA01022-0750-D/7060988     On
```

```
PCIBOX#2007/IOB    IOBOARD 1080   PP12470297     CA20365-B66X 010AJ/7061033 On
PCIBOX#2007/LINKBD BOARD    -     PP1244027P     CA20365-B60X 001AA/7061035 On
PCIBOX#2007/FANBP  FANBP    -     PP12470298     CA20365-B68X 005AD/7061025 On
BB#00-PCI#10       CARD    1080   PP124401LZ     CA20365-B59X 001AA/7061040 On
```

A firmware version is displayed as a four-digit release number in "xyyz" format. Each release number is indicated in "xyyz" format, as follows.

- x: Major release number
- yy: Minor release number
- z: Micro release number

Check method when the system has been started

1. **Log in to the XSCF shell in the master chassis.**
   - For the SPARC M10-1/M10-4
     The chassis is always a master chassis because this is a single-chassis configuration.
   - For the SPARC M10-4S (without the crossbar box)
     The master chassis is the chassis where the MASTER LED (green) is on on the rear of the chassis of BB-ID#00 and #01.
   - For the SPARC M10-4S (with the crossbar box)
     The master chassis is the chassis where the MASTER LED (green) is on on the rear of the chassis of BB-ID#80 and #81.
2. **If multiple PCI expansion units are connected, execute the ioxadm list command to check the combination of the link card and the I/O board.**

```
XSCF> ioxadm list
PCIBOX       Link
PCIBOX#1007  BB#00-PCI#10
PCIBOX#1006  BB#00-PCI#09
PCIBOX#1005  BB#00-PCI#08
PCIBOX#1004  BB#00-PCI#07
```

3. **Execute the ioxadm -v list command to check the serial number and the firmware version of the PCI expansion unit.**
   [Location] displays the last four digits of the serial number of the PCI expansion unit, and [FW Ver] displays the firmware version of the link card ("CARD" shown on [Type]) and that of the I/O board ("IOBOARD" shown on [Type]).

   The following example shows that "2007" is the last four digits of the serial number of the PCI expansion unit and "1080" is the firmware version of the link card and the I/O board.

```
XSCF> ioxadm -v list
Location           Type    FW Ver  Serial Num          Part Num          State
PCIBOX#2007        PCIBOX   -      PZ21242007                               On
PCIBOX#2007/PSU#0  PSU      -      FEJD1212000521 CA01022-0750-D/7060988     On
PCIBOX#2007/PSU#1  PSU      -      FEJD1201000738 CA01022-0750-D/7060988     On
```

```
PCIBOX#2007/IOB     IOBOARD 1080   PP12470297     CA20365-B66X 010AJ/7061033 On
PCIBOX#2007/LINKBD BOARD     -     PP1244027P     CA20365-B60X 001AA/7061035 On
PCIBOX#2007/FANBP  FANBP     -     PP12470298     CA20365-B68X 005AD/7061025 On
BB#00-PCI#10       CARD    1080   PP124401LZ     CA20365-B59X 001AA/7061040 On
```

A firmware version is displayed as a four-digit release number in "xyyz" format. Each release number is indicated in "xyyz" format, as follows.

- x: Major release number
- yy: Minor release number
- z: Micro release number

6.6.2 Time required for updating

The following shows the time required for updating.

Table 6-5 Time required for updating

System status	Updating time
The system is operating with a PCI expansion unit recognized from the XSCF	About 30 minutes

6.6.3 Flow of update process

The following table lists the sequence of the update procedure for the firmware. See the relevant sections.

Table 6-6 Flow of update process

Task	
1	"Preparing the firmware"
2	"Importing the firmware into the system"
3	"Updating the firmware"

6.6.4 Updating the firmware

This section describes the procedure for updating the firmware.

Preparing the firmware

1. **Download the firmware file from the following website.**

Download the firmware file to an arbitrary folder on a PC or workstation that is connected to the system.

Note - The information on these sites is for customers of Fujitsu.

- Japanese site
  Customers who subscribe to SupportDesk can download the firmware file from the SupportDesk-Web.
- Global site
  For the latest firmware file, contact your sales representative.

2. **Check the downloaded firmware version number.**
   For the firmware version, refer to the four-digit number of the firmware file (tar.gz).

Importing the firmware into the system

This section describes how to import the firmware with the CLI using the USB memory.
When using the XSCF Web, the procedure is the same as that for updating the XSCF.

Note - Perform this task with a user account that has the platadm or fieldeng privilege.

1. **Log in to the XSCF shell in the master chassis.**
   - For the SPARC M10-1/M10-4
     The chassis is always a master chassis because this is a single-chassis configuration.
   - For the SPARC M10-4S (without the crossbar box)
     The master chassis is the chassis where the MASTER LED (green) is on on the rear of the chassis of BB-ID#00 and #01.
   - For the SPARC M10-4S (with the crossbar box)
     The master chassis is the chassis where the MASTER LED (green) is on on the rear of the chassis of BB-ID#80 and #81.
2. **Connect the USB memory to the USB port of the server.**

Note - Connect the USB memory to the USB port shown as "MAINTENANCE ONLY."

3. **Execute the getflashimage command to import the downloaded firmware into the system.**
   Specify the downloaded firmware file (tar.gz).

   In the following example, the PCIBOX1100.tar.gz file in the images folder of the USB memory is specified.

```
XSCF> getflashimage file:///media/usb_msd/images/PCIBOX1100.tar.gz
```

If the procedure ends successfully, "Download successful: ..." will be displayed first, and then "MD5: ..." will be displayed.

4. **Execute the getflashimage command, and confirm that the PCI expansion unit firmware has been imported.**

```
XSCF> getflashimage -l
```

Updating the firmware

Note - Perform this task with a user account that has the fieldeng privilege.

1. **Execute the ioxadm command to check the version of the firmware that is currently running.**

```
XSCF> ioxadm -v list
```

For details, see "6.6.1 How to check the serial number and firmware version of the PCI expansion unit."

2. **Execute the ioxadm command to update the firmware.**
In the following example, the PCIBOX#2007 firmware is updated to the 1100 version.

```
XSCF> ioxadm -c update PCIBOX#2007 -s 1100
Firmware update is started. (version=1100)
Firmware update has been completed.
```

After "Firmware update is started." is displayed, nothing is displayed for about 30 minutes before "Firmware update has been completed." is displayed.

3. **Execute the ioxadm command to check the firmware version.**
Confirm that the firmware version of the updated firmware is correct.

```
XSCF> ioxadm -v list
```

For details, see "6.6.1 How to check the serial number and firmware version of the PCI expansion unit."

4. **To reflect the firmware, you need to release and reconnect the link card.**
Methods a, b, and c below are available for releasing the link card:

   a. Releasing and reconnecting the link card after stopping the system

      Stop the system after restoring the original Auto boot setting of the target physical partition. Also, after stopping the system, return the mode switch on the operation panel to Locked mode. The firmware will be reflected at the next startup.

```
{0} ok setenv auto-boot? true
XSCF> poweroff -p 0
```

b. Releasing the link card using PHP

For details, see "5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)" and "6.3.1 Mounting a link card using PCI hot plug (PHP)."

c. Releasing the link card using physical partition dynamic reconfiguration (DR)

For details, see "5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)" and "6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)."

Chapter 7

Maintenance Flow

This chapter describes the maintenance workflow.
Be sure to check the notes on FRUs requiring maintenance in the *Fujitsu M10/SPARC M10 Systems Product Notes* for the latest XCP version.

- FRU Replacement Workflow for the PCI Expansion Unit
- FRU Installation Workflow for the PCI Expansion Unit
- FRU Removal Workflow for the PCI Expansion Unit

Check the notes on maintenance in "4.2 Precautions for Maintenance" before performing maintenance, and then proceed with your work according to the following maintenance workflow.

Table 7-1 Maintenance workflow

Item	Procedure	Reference
1	Identifying the FRU to be replaced	"4.1.2 Identifying a failure"
2	Checking the available maintenance types	"Table 7-2 List of available maintenance types by FRU"
3	Hot maintenance (*1)	
3-a	Hot replacement	"7.1.1 Hot replacement"
3-b	Hot addition	"7.2.1 Hot addition"
3-c	Hot removal	"7.3.1 Hot removal"
4	Cold maintenance	
4-a	Cold replacement	"7.1.2 Cold replacement"
4-b	Cold addition	"7.2.2 Cold addition"
4-c	Cold removal	"7.3.2 Cold removal"

*1 To perform PCIe card maintenance using PHP, confirm that the card is PHP enabled. To do so, check "Appendix A Cards that Support PCI Hot Plug and Dynamic Reconfiguration" in the *Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide*.

Table 7-2 List of available maintenance types by FRU

-: Not maintainable

FRU	SPARC M10-1		SPARC M10-4/M10-4S (single-unit configuration)		SPARC M10-4S (building block configuration)	
	Hot maintenance	Cold maintenance	Hot maintenance	Cold maintenance	Hot maintenance	Cold maintenance
PCI Express card (*1)	OK	OK	OK	OK	OK	OK
Link board (*2)	-	OK	OK	OK	OK	OK
Link card (mounted on server)	-	OK	OK	OK	OK	OK
Link cable	-	OK	OK	OK	OK	OK
Management cable	-	OK	OK	OK	OK	OK
Power supply unit (*3)	OK	OK	OK	OK	OK	OK
Fan unit	OK	OK	OK	OK	OK	OK
PCI tray	-	OK	-	OK	-	OK
I/O board	-	OK	-	OK	-	OK
Fan backplane	-	OK	-	OK	-	OK

*1 Maintenance work is performed using PCI hot plug (PHP). While referring to "3.3.2 How to check whether PCI hot plug (PHP) can be used," check whether PHP is usable. If the setting for the direct I/O function is enabled, then maintenance with the system stopped must be performed because the PCIe card cannot use PHP.
*2 It is necessary to use the PCI Hot Plug (PHP) to release the link card mounted on a destination server from the system. If the setting for the direct I/O function is enabled, then maintenance with the system stopped must be performed because the link card cannot use PHP.
*3 This is supported only for a redundant configuration.

7.1 FRU Replacement Workflow for the PCI Expansion Unit

This section describes the replacement workflow for the following FRUs of the PCI expansion unit:

- PCI Express card
- Link board
- Link cable
- Management cable
- Power supply unit
- Fan unit
- PCI tray
- I/O board
- Fan backplane

7.1.1 Hot replacement

This section describes the hot replacement workflow.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

The following patterns are available for hot replacement.

- Hot replacement (for a PCI Express card)
- Hot replacement (for a power supply unit or fan unit)

Hot replacement (for a PCI Express card)

Hot replacement is applicable to the PCI Express card. Perform replacement according to the following procedure.

Figure 7-1 Hot replacement flow (for a PCI Express card)

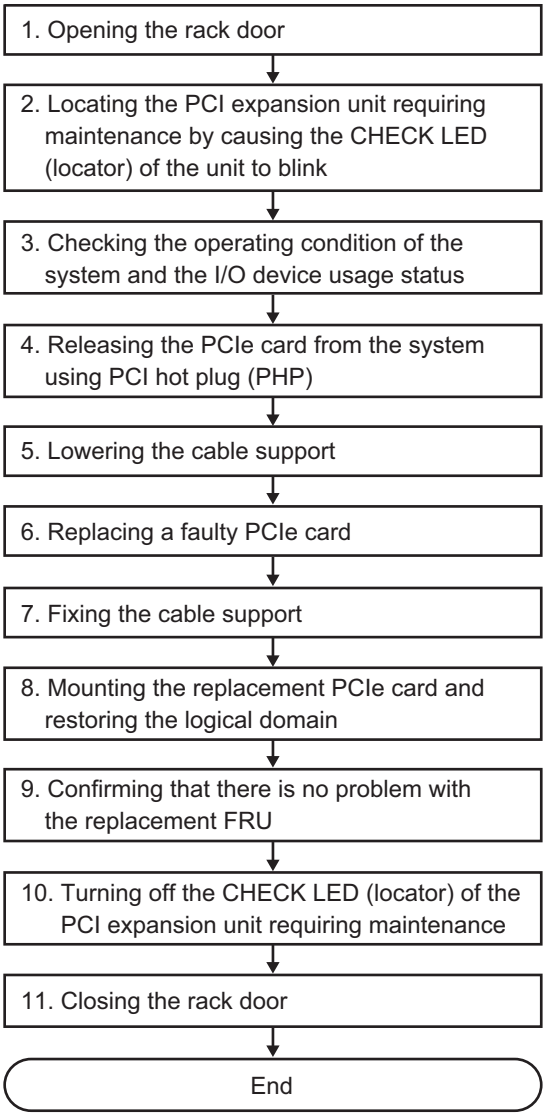

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the PCIe card from the system using PCI hot plug (PHP)
5. Lowering the cable support
6. Replacing a faulty PCIe card
7. Fixing the cable support
8. Mounting the replacement PCIe card and restoring the logical domain
9. Confirming that there is no problem with the replacement FRU
10. Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance
11. Closing the rack door
End

Table 7-3 Hot replacement work procedure (for a PCI Express card)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
4	Releasing the PCIe card from the system using PCI hot plug (PHP)	"5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)"
5	Lowering the cable support	"5.7.1 Lowering the cable support"
6	Replacing a faulty PCIe card	"Chapter 8 Maintaining the PCI Express Cards"
7	Fixing the cable support	"6.1.3 Fixing the cable support"
8	Mounting the replacement PCIe card and restoring the logical domain	"6.3.3 Mounting a PCIe card on the server using PCI hot plug (PHP)"
9	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
10	Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance	"6.5 Turning off the CHECK LED (Locator) of the PCI Expansion Unit"
11	Closing the rack door	

Hot replacement (for a power supply unit or fan unit)

Hot replacement is applicable to the power supply unit and fan unit. Perform replacement according to the following procedure.

Figure 7-2 Hot replacement flow (for a power supply unit/fan unit)

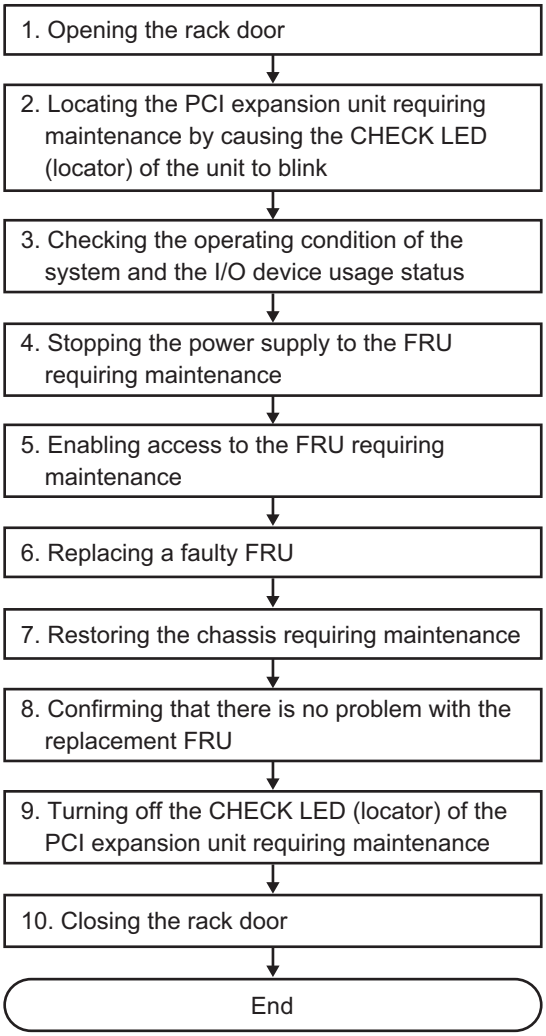

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Stopping the power supply to the FRU requiring maintenance
5. Enabling access to the FRU requiring maintenance
6. Replacing a faulty FRU
7. Restoring the chassis requiring maintenance
8. Confirming that there is no problem with the replacement FRU
9. Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance
10. Closing the rack door
End

Table 7-4 Hot replacement work procedure (for a power supply unit or fan unit)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
4	Stopping the power supply to the FRU requiring maintenance	"5.6 Stopping the FRU Requiring Maintenance"
5	Enabling access to the FRU requiring maintenance	For a power supply unit, "5.7.1 Lowering the cable support" For a fan unit, "5.7.3 Removing the front cover"
6	Replacing a faulty FRU	"Chapter 13 Maintaining the Power Supply Units" "Chapter 14 Maintaining the Fan Units"
7	Restoring the chassis requiring maintenance	For a power supply unit, "6.1.3 Fixing the cable support" For a fan unit, "6.1.1 Installing the front cover"
8	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
9	Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance	"6.5 Turning off the CHECK LED (Locator) of the PCI Expansion Unit"
10	Closing the rack door	

7.1.2 Cold replacement

This section describes the cold replacement workflow.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

Cold replacement work varies depending on the method of releasing the link card mounted on the destination server. The following are the work patterns.

- Cold replacement (releasing the link card after stopping the system)
- Cold replacement (releasing the link card using PHP)
- Cold replacement (releasing the link card using DR)

Cold replacement (releasing the link card after stopping the system)

Cold replacement can be performed for all the FRUs mounted on the PCI expansion unit after stopping the system to which the PCI expansion unit is connected. This can be done when the connection destination of the PCI expansion unit is a SPARC M10-1/M10-4/M10-4S.

Figure 7-3 Cold replacement flow (releasing the link card after stopping the system)

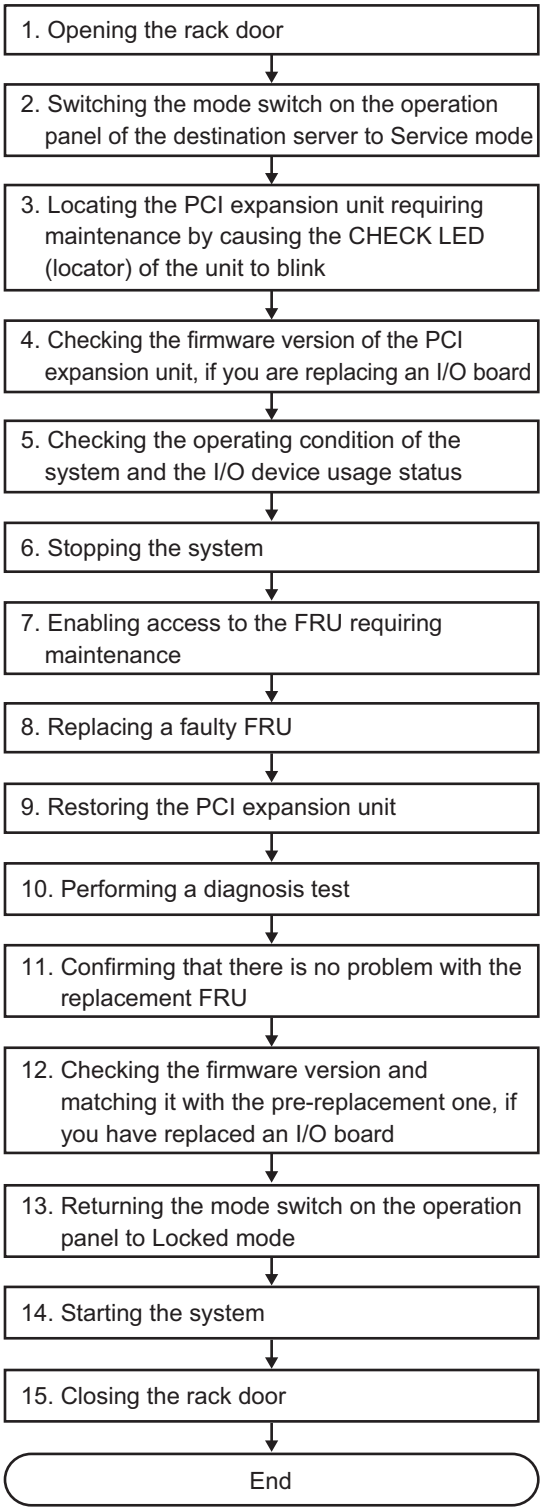

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the firmware version of the PCI expansion unit, if you are replacing an I/O board
5. Checking the operating condition of the system and the I/O device usage status
6. Stopping the system
7. Enabling access to the FRU requiring maintenance
8. Replacing a faulty FRU
9. Restoring the PCI expansion unit
10. Performing a diagnosis test
11. Confirming that there is no problem with the replacement FRU
12. Checking the firmware version and matching it with the pre-replacement one, if you have replaced an I/O board
13. Returning the mode switch on the operation panel to Locked mode
14. Starting the system
15. Closing the rack door
End

Table 7-5 Cold replacement work procedure (Releasing the link card after stopping the system)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the firmware version of the PCI expansion unit, if you are replacing an I/O board	"5.3 Checking the Firmware Version of the PCI Expansion Unit"
5	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
6	Stopping the system	"5.5.3 Releasing the link card or PCIe card after stopping the system"
7	Enabling access to the FRU requiring maintenance	"5.7 Accessing an FRU"
8	Replacing a faulty FRU	"Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the Link Board" "Chapter 11 Maintaining the Link Cables" "Chapter 12 Maintaining the Management Cable" "Chapter 13 Maintaining the Power Supply Units" "Chapter 14 Maintaining the Fan Units" "Chapter 15 Maintaining the PCI Tray" "Chapter 16 Maintaining the I/O Board" "Chapter 17 Maintaining the Fan Backplane"
9	Restoring the PCI expansion unit	"6.1 Restoring the Chassis of the PCI Expansion Unit"
10	Performing a diagnosis test	"6.3 Diagnosing a Replacement FRU" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.4 Diagnosing a Replacement FRU" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
12	Checking the firmware version and matching it with the pre-replacement one, if you have replaced an I/O board	"6.6 Updating the Firmware of the PCI Expansion Unit"
13	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.8 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*

Table 7-5 Cold replacement work procedure (Releasing the link card after stopping the system) *(continued)*

Item	Task	Reference
14	Starting the system	"6.8 Starting the Entire System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.9 Starting the System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
15	Closing the rack door	

Cold replacement (releasing the link card using PHP)

Cold replacement can be performed for all the FRUs mounted on the PCI expansion unit after releasing the link card mounted on the destination server from the system using the PCI hot plug (PHP). This can be done only when the connection destination of the PCI expansion unit is a SPARC M10-4/M10-4S and the setting for the direct I/O function is disabled.

Figure 7-4 Cold replacement flow (releasing the link card using PHP)

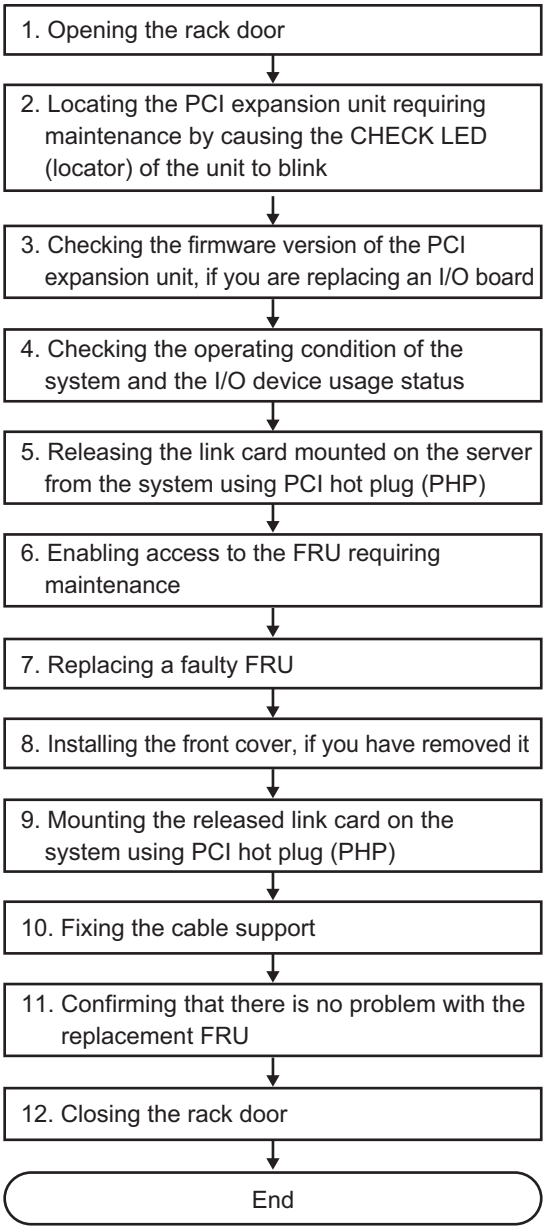

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the firmware version of the PCI expansion unit, if you are replacing an I/O board
4. Checking the operating condition of the system and the I/O device usage status
5. Releasing the link card mounted on the server from the system using PCI hot plug (PHP)
6. Enabling access to the FRU requiring maintenance
7. Replacing a faulty FRU
8. Installing the front cover, if you have removed it
9. Mounting the released link card on the system using PCI hot plug (PHP)
10. Fixing the cable support
11. Confirming that there is no problem with the replacement FRU
12. Closing the rack door
End

Table 7-6 Cold replacement work procedure (Releasing the link card using PHP)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the firmware version of the PCI expansion unit, if you are replacing an I/O board	"5.3 Checking the Firmware Version of the PCI Expansion Unit"
4	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
5	Releasing the link card mounted on the server from the system using PCI hot plug (PHP)	"5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)"
6	Enabling access to the FRU requiring maintenance	"5.7 Accessing an FRU"
7	Replacing a faulty FRU	"Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the Link Board" "Chapter 11 Maintaining the Link Cables" "Chapter 12 Maintaining the Management Cable" "Chapter 13 Maintaining the Power Supply Units" "Chapter 14 Maintaining the Fan Units" "Chapter 15 Maintaining the PCI Tray" "Chapter 16 Maintaining the I/O Board" "Chapter 17 Maintaining the Fan Backplane"
8	Installing the front cover, if you have removed it	"6.1.1 Installing the front cover"
9	Mounting the released link card on the system using PCI hot plug (PHP)	"6.3.1 Mounting a link card using PCI hot plug (PHP)"
10	Fixing the cable support	"6.1.3 Fixing the cable support"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
12	Closing the rack door	

Cold replacement (releasing the link card using DR)

Cold maintenance can be performed for all the FRUs mounted on the PCI expansion unit after releasing the chassis in which the link card is mounted from the system using physical partition dynamic reconfiguration (DR). This can be done only when the connection destination of the PCI expansion unit has the building block configuration of the SPARC M10-4S.

Figure 7-5 Cold replacement flow (releasing the link card using DR)

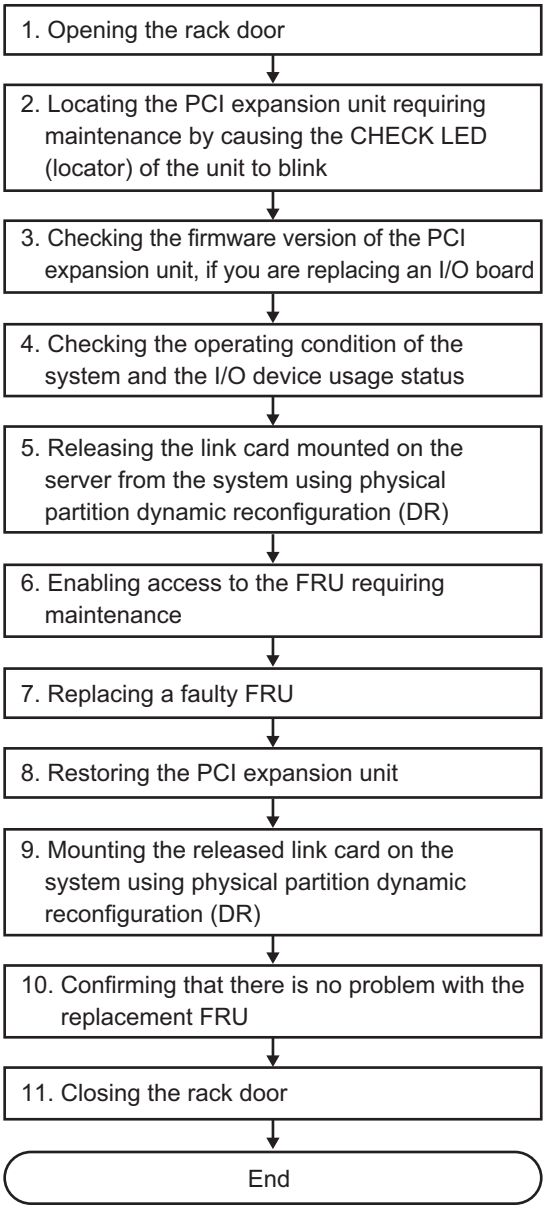

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the firmware version of the PCI expansion unit, if you are replacing an I/O board
4. Checking the operating condition of the system and the I/O device usage status
5. Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)
6. Enabling access to the FRU requiring maintenance
7. Replacing a faulty FRU
8. Restoring the PCI expansion unit
9. Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)
10. Confirming that there is no problem with the replacement FRU
11. Closing the rack door
End

Table 7-7 Cold replacement work procedure (Releasing the link card using DR)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the firmware version of the PCI expansion unit, if you are replacing an I/O board	"5.3 Checking the Firmware Version of the PCI Expansion Unit"
4	Checking the operating condition of the system and the I/O device usage status	"5.4 Checking the Operating Condition and Resource Usage Status"
5	Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)	"5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)"
6	Enabling access to the FRU requiring maintenance	"5.7 Accessing an FRU"
7	Replacing a faulty FRU	"Chapter 8 Maintaining the PCI Express Cards" "Chapter 9 Maintaining the Link Board" "Chapter 11 Maintaining the Link Cables" "Chapter 12 Maintaining the Management Cable" "Chapter 13 Maintaining the Power Supply Units" "Chapter 14 Maintaining the Fan Units" "Chapter 15 Maintaining the PCI Tray" "Chapter 16 Maintaining the I/O Board" "Chapter 17 Maintaining the Fan Backplane"
8	Restoring the PCI expansion unit	"6.1 Restoring the Chassis of the PCI Expansion Unit"
9	Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)	"6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)"
10	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
11	Closing the rack door	

7.2 FRU Installation Workflow for the PCI Expansion Unit

This section describes the installation workflow for the following FRU of the PCI expansion unit:

- PCI Express card

7.2.1 Hot addition

This section describes the hot addition workflow.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

The following patterns are available for hot addition.

- Hot addition (for a PCI Express card)

Hot addition (for a PCI Express card)

Hot addition is applicable to the PCI Express card. Perform addition according to the following procedure.

Figure 7-6 Hot addition flow (for a PCI Express card)

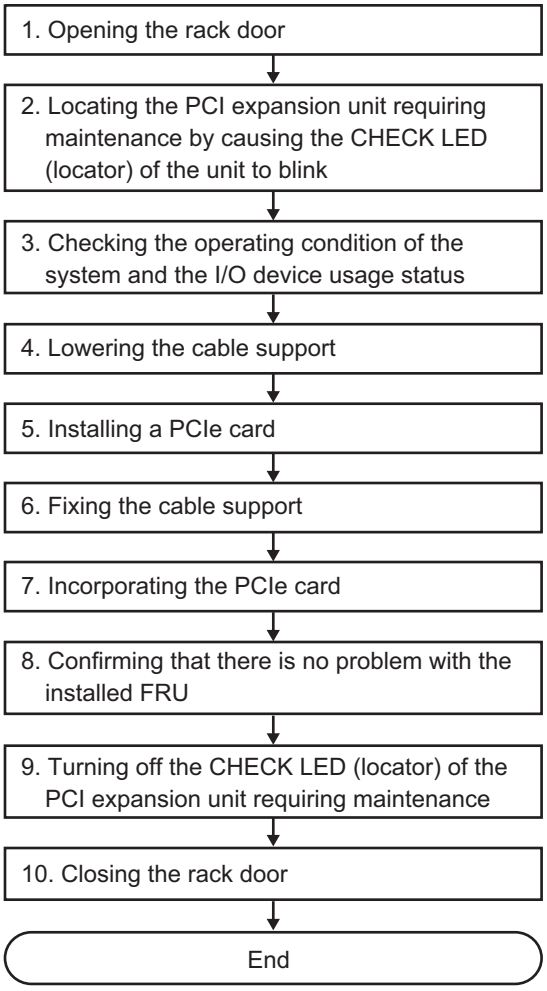

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Lowering the cable support
5. Installing a PCIe card
6. Fixing the cable support
7. Incorporating the PCIe card
8. Confirming that there is no problem with the installed FRU
9. Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance
10. Closing the rack door
End

Table 7-8 Hot addition work procedure

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
4	Lowering the cable support	"5.7.1 Lowering the cable support"
5	Installing a PCIe card	"Chapter 8 Maintaining the PCI Express Cards"
6	Fixing the cable support	"6.1.3 Fixing the cable support"
7	Incorporating the PCIe card	"6.3.3 Mounting a PCIe card on the server using PCI hot plug (PHP)"
8	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
9	Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance	"6.5 Turning off the CHECK LED (Locator) of the PCI Expansion Unit"
10	Closing the rack door	

7.2.2 Cold addition

This section describes the cold addition workflow.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

Cold addition work varies depending on the method of releasing the link card mounted on the destination server. The following are the work patterns.

- Cold addition (releasing the link card after stopping the system)
- Cold addition (releasing the link card using PHP)
- Cold addition (releasing the link card using DR)

Cold addition (releasing the link card after stopping the system)

Cold addition of a PCI Express card to the PCI expansion unit can be performed after stopping the system to which the PCI expansion unit is connected. This can be done when the connection destination of the PCI expansion unit is a SPARC M10-1/M10-4/M10-4S.

Figure 7-7 Cold addition flow (releasing the link card after stopping the system)

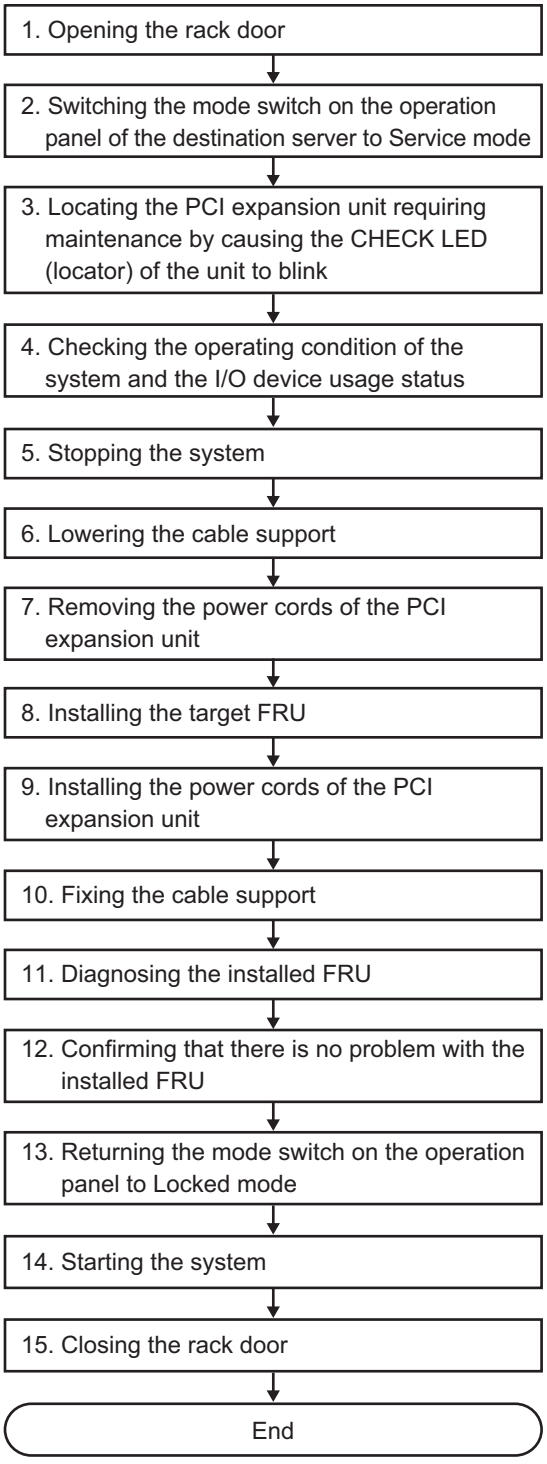

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the operating condition of the system and the I/O device usage status
5. Stopping the system
6. Lowering the cable support
7. Removing the power cords of the PCI expansion unit
8. Installing the target FRU
9. Installing the power cords of the PCI expansion unit
10. Fixing the cable support
11. Diagnosing the installed FRU
12. Confirming that there is no problem with the installed FRU
13. Returning the mode switch on the operation panel to Locked mode
14. Starting the system
15. Closing the rack door
End

Table 7-9 Cold addition work procedure (releasing the link card after stopping the system)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
5	Stopping the system	"5.5.3 Releasing the link card or PCIe card after stopping the system"
6	Lowering the cable support	"5.7.1 Lowering the cable support"
7	Removing the power cords of the PCI expansion unit	"5.7.2 Removing the power cord"
8	Installing the target FRU	"Chapter 8 Maintaining the PCI Express Cards"
9	Installing the power cords of the PCI expansion unit	"6.1.2 Installing the power cords"
10	Fixing the cable support	"6.1.3 Fixing the cable support"
11	Diagnosing the installed FRU	"6.3 Diagnosing a Replacement FRU" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.4 Diagnosing a Replacement FRU" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
12	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
13	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.8 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
14	Starting the system	"6.8 Starting the Entire System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.9 Starting the System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
15	Closing the rack door	

Cold addition (releasing the link card using PHP)

Cold addition of a PCI Express card to the PCI expansion unit can be performed after releasing the link card mounted on the destination server from the system using the PCI hot plug (PHP). This can be done only when the connection destination of the PCI expansion unit is a SPARC M10-4/M10-4S and the setting for the direct I/O function is disabled.

Figure 7-8 Cold addition flow (releasing the link card using PHP)

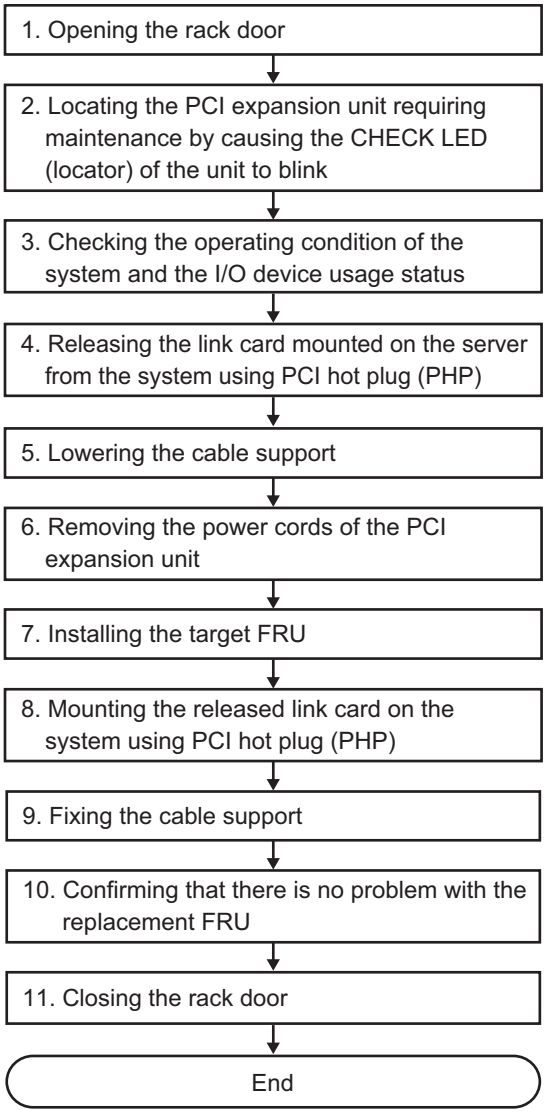

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the link card mounted on the server from the system using PCI hot plug (PHP)
5. Lowering the cable support
6. Removing the power cords of the PCI expansion unit
7. Installing the target FRU
8. Mounting the released link card on the system using PCI hot plug (PHP)
9. Fixing the cable support
10. Confirming that there is no problem with the replacement FRU
11. Closing the rack door
End

Table 7-10 Cold addition work procedure (Releasing the link card using PHP)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
4	Releasing the link card mounted on the server from the system using PCI hot plug (PHP)	"5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)"
5	Lowering the cable support	"5.7.1 Lowering the cable support"
6	Removing the power cords of the PCI expansion unit	"5.7.2 Removing the power cord"
7	Installing the target FRU	"Chapter 8 Maintaining the PCI Express Cards"
8	Mounting the released link card on the system using PCI hot plug (PHP)	"6.3.1 Mounting a link card using PCI hot plug (PHP)"
9	Fixing the cable support	"6.1.3 Fixing the cable support"
10	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
11	Closing the rack door	

Cold addition (releasing the link card using DR)

Cold addition of a PCI Express card to the PCI expansion unit can be performed after releasing the chassis in which the link card is mounted from the system using physical partition dynamic reconfiguration (DR). This can be done only when the connection destination of the PCI expansion unit has the building block configuration of the SPARC M10-4S.

Figure 7-9 Cold addition flow (releasing the link card using DR)

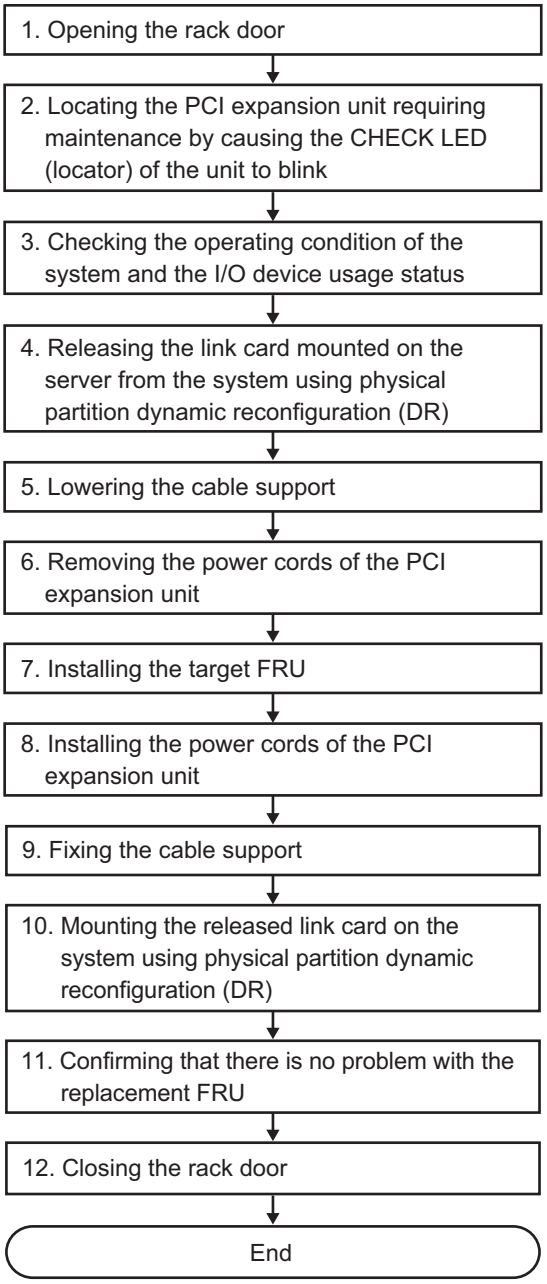

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)
5. Lowering the cable support
6. Removing the power cords of the PCI expansion unit
7. Installing the target FRU
8. Installing the power cords of the PCI expansion unit
9. Fixing the cable support
10. Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)
11. Confirming that there is no problem with the replacement FRU
12. Closing the rack door
End

Table 7-11 Cold addition work procedure (Releasing the link card using DR)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4 Checking the Operating Condition and Resource Usage Status"
4	Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)	"5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)"
5	Lowering the cable support	"5.7.1 Lowering the cable support"
6	Removing the power cords of the PCI expansion unit	"5.7.2 Removing the power cord"
7	Installing the target FRU	"Chapter 8 Maintaining the PCI Express Cards"
8	Installing the power cords of the PCI expansion unit	"6.1.2 Installing the power cords"
9	Fixing the cable support	"6.1.3 Fixing the cable support"
10	Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)	"6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
12	Closing the rack door	

7.3 FRU Removal Workflow for the PCI Expansion Unit

This section describes the removal workflow for the following FRU of the PCI expansion unit:

- PCI Express card

7.3.1 Hot removal

This section describes the hot removal workflow.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

The following patterns are available for hot removal.

- Hot removal (for a PCI Express card)

Hot removal (for a PCI Express card)

Hot removal is applicable to the PCI Express card. Perform removal according to the following procedure.

Figure 7-10 Hot removal flow (for a PCI Express card)

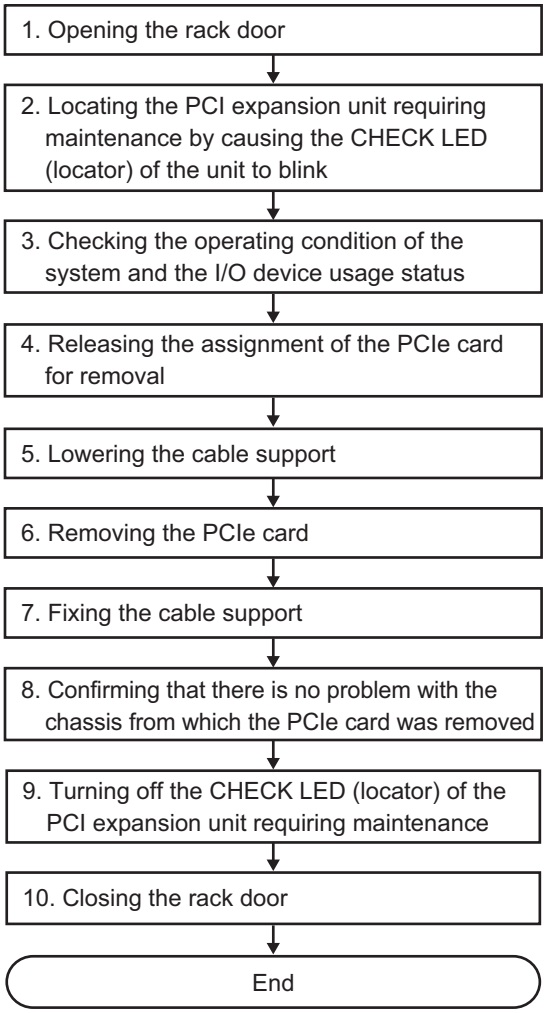

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the assignment of the PCIe card for removal
5. Lowering the cable support
6. Removing the PCIe card
7. Fixing the cable support
8. Confirming that there is no problem with the chassis from which the PCIe card was removed
9. Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance
10. Closing the rack door
End

Table 7-12 Hot removal work procedure (for a PCI Express card)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
4	Releasing the assignment of the PCIe card for removal	"5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)"
5	Lowering the cable support	"5.7.1 Lowering the cable support"
6	Removing the PCIe card	"Chapter 8 Maintaining the PCI Express Cards"
7	Fixing the cable support	"6.1.3 Fixing the cable support"
8	Confirming that there is no problem with the chassis from which the PCIe card was removed	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
9	Turning off the CHECK LED (locator) of the PCI expansion unit requiring maintenance	"6.5 Turning off the CHECK LED (Locator) of the PCI Expansion Unit"
10	Closing the rack door	

7.3.2 Cold removal

This section describes the cold removal workflow.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

Cold removal work varies depending on the method of releasing the link card mounted on the destination server. The following are the work patterns.

- Cold removal (releasing the link card after stopping the system)
- Cold removal (releasing the link card using PHP)
- Cold removal (releasing the link card using DR)

Cold removal (releasing the link card after stopping the system)

Cold removal of a PCI Express card from the PCI expansion unit can be performed after stopping the system to which the PCI expansion unit is connected. This can be done when the connection destination of the PCI expansion unit is a SPARC M10-1/M10-4/M10-4S.

Figure 7-11 Cold removal flow (releasing the link card after stopping the system)

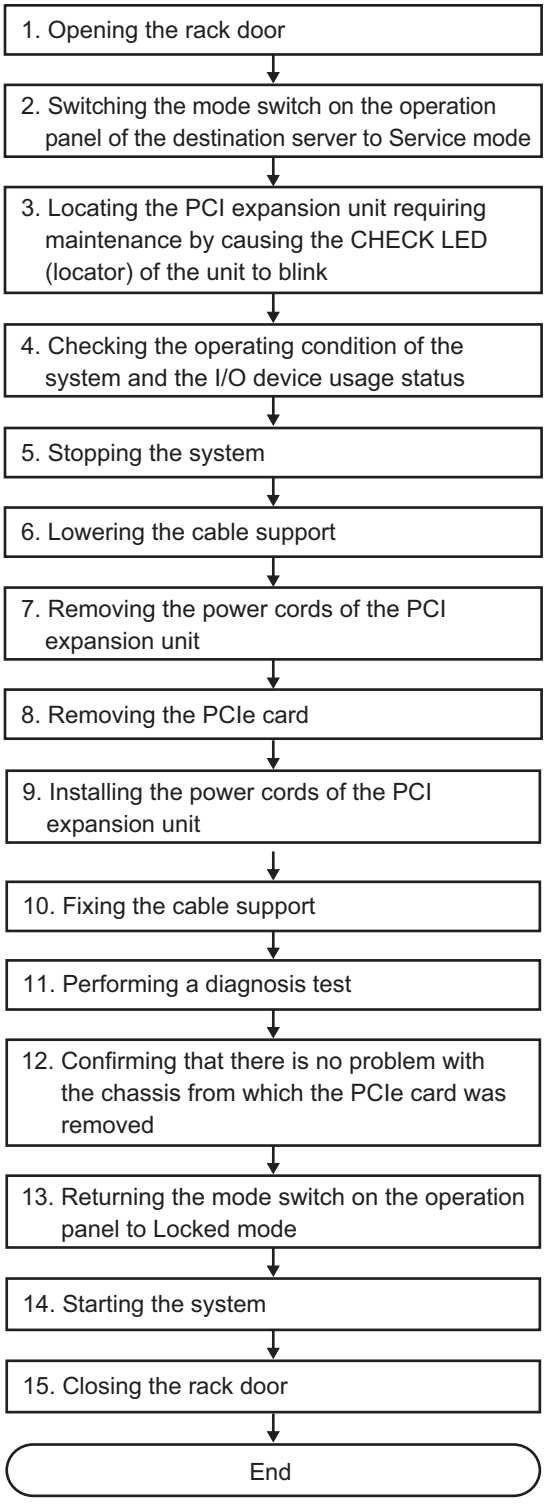

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the operating condition of the system and the I/O device usage status
5. Stopping the system
6. Lowering the cable support
7. Removing the power cords of the PCI expansion unit
8. Removing the PCIe card
9. Installing the power cords of the PCI expansion unit
10. Fixing the cable support
11. Performing a diagnosis test
12. Confirming that there is no problem with the chassis from which the PCIe card was removed
13. Returning the mode switch on the operation panel to Locked mode
14. Starting the system
15. Closing the rack door
End

Table 7-13 Cold removal work procedure (releasing the link card after stopping the system)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
5	Stopping the system	"5.5.3 Releasing the link card or PCIe card after stopping the system"
6	Lowering the cable support	"5.7.1 Lowering the cable support"
7	Removing the power cords of the PCI expansion unit	"5.7.2 Removing the power cord"
8	Removing the PCIe card	"Chapter 8 Maintaining the PCI Express Cards"
9	Installing the power cords of the PCI expansion unit	"6.1.2 Installing the power cords"
10	Fixing the cable support	"6.1.3 Fixing the cable support"
11	Performing a diagnosis test	"6.3 Diagnosing a Replacement FRU" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.4 Diagnosing a Replacement FRU" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
12	Confirming that there is no problem with the chassis from which the PCIe card was removed	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
13	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.8 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
14	Starting the system	"6.8 Starting the Entire System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.9 Starting the System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
15	Closing the rack door	

Cold removal (releasing the link card using PHP)

Cold removal of a PCI Express card from the PCI expansion unit can be performed after releasing the link card mounted on the destination server from the system using the PCI hot plug (PHP). This can be done only when the connection destination of the PCI expansion unit is a SPARC M10-4/M10-4S and the setting for the direct I/O function is disabled.

Figure 7-12 Cold removal flow (releasing the link card using PHP)

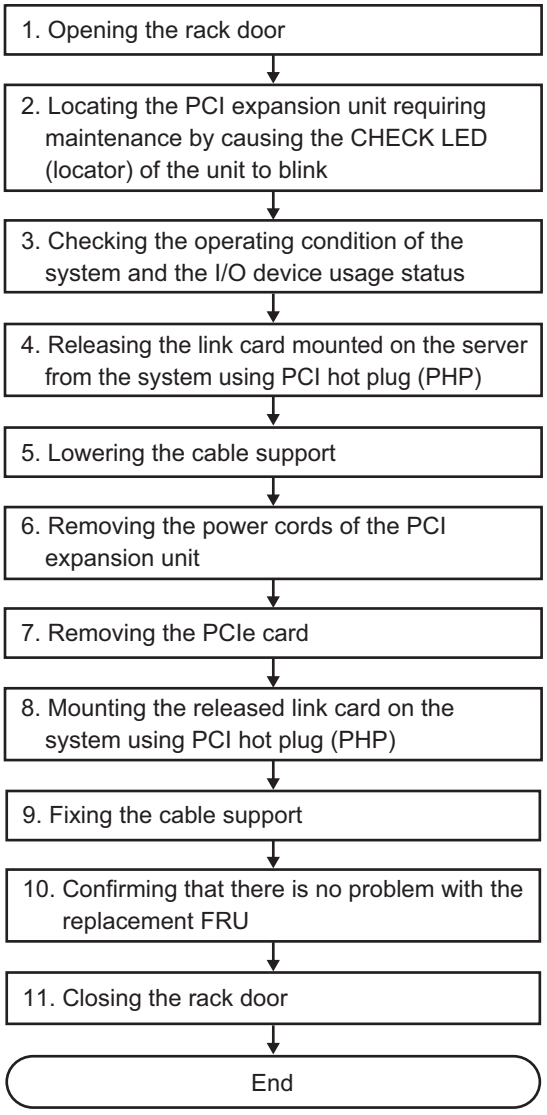

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the link card mounted on the server from the system using PCI hot plug (PHP)
5. Lowering the cable support
6. Removing the power cords of the PCI expansion unit
7. Removing the PCIe card
8. Mounting the released link card on the system using PCI hot plug (PHP)
9. Fixing the cable support
10. Confirming that there is no problem with the replacement FRU
11. Closing the rack door
End

Table 7-14 Cold removal work procedure (Releasing the link card using PHP)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
4	Releasing the link card mounted on the server from the system using PCI hot plug (PHP)	"5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)"
5	Lowering the cable support	"5.7.1 Lowering the cable support"
6	Removing the power cords of the PCI expansion unit	"5.7.2 Removing the power cord"
7	Removing the PCIe card	"Chapter 8 Maintaining the PCI Express Cards"
8	Mounting the released link card on the system using PCI hot plug (PHP)	"6.3.1 Mounting a link card using PCI hot plug (PHP)"
9	Fixing the cable support	"6.1.3 Fixing the cable support"
10	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
11	Closing the rack door	

Cold removal (releasing the link card using DR)

Cold removal of a PCI Express card from the PCI expansion unit can be performed after releasing the chassis in which the link card is mounted from the system using physical partition dynamic reconfiguration (DR). This can be done only when the connection destination of the PCI expansion unit has the building block configuration of the SPARC M10-4S.

Figure 7-13 Cold removal flow (releasing the link card using DR)

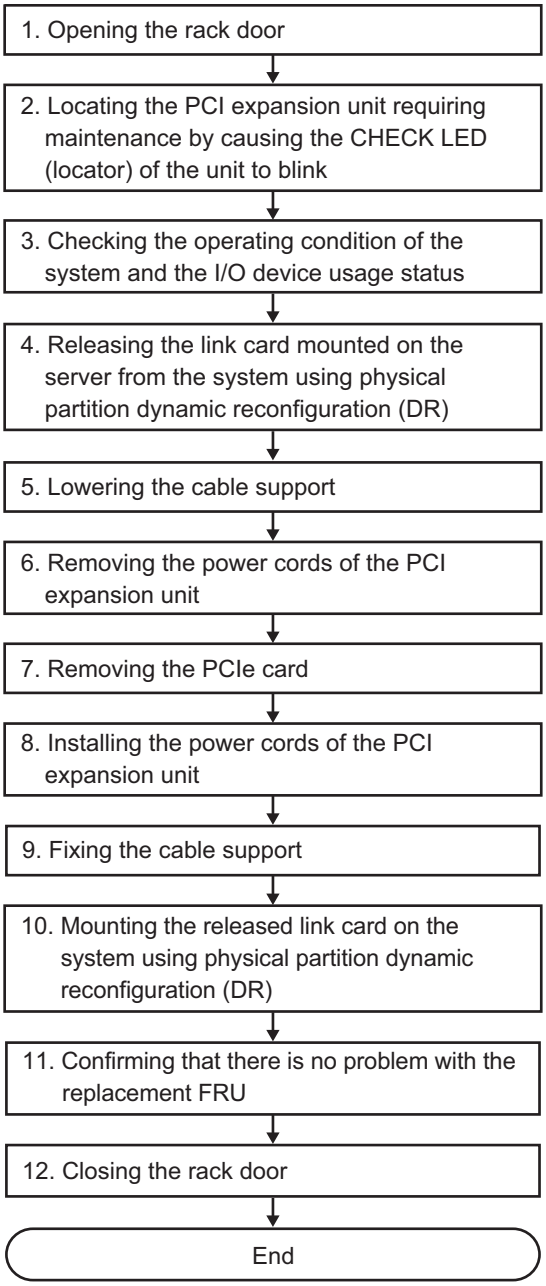

1. Opening the rack door
2. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)
5. Lowering the cable support
6. Removing the power cords of the PCI expansion unit
7. Removing the PCIe card
8. Installing the power cords of the PCI expansion unit
9. Fixing the cable support
10. Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)
11. Confirming that there is no problem with the replacement FRU
12. Closing the rack door
End

Table 7-15 Cold removal work procedure (Releasing the link card using DR)

Item	Task	Reference
1	Opening the rack door	
2	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
3	Checking the operating condition of the system and the I/O device usage status	"5.4 Checking the Operating Condition and Resource Usage Status"
4	Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)	"5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)"
5	Lowering the cable support	"5.7.1 Lowering the cable support"
6	Removing the power cords of the PCI expansion unit	"5.7.2 Removing the power cord"
7	Removing the PCIe card	"Chapter 8 Maintaining the PCI Express Cards"
8	Installing the power cords of the PCI expansion unit	"6.1.2 Installing the power cords"
9	Fixing the cable support	"6.1.3 Fixing the cable support"
10	Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)	"6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
12	Closing the rack door	

7.4 Link Card Maintenance Workflow

This section describes the link card maintenance workflow.

Note - When performing work for any replacement, addition, or removal of the link card, check "1.7 Important Information about the XCP Firmware" in advance.

7.4.1 Active maintenance

This section describes the flows of the active replacement, active addition, and active removal for the link card.
References to detailed descriptions are written in the work procedure tables. See any

of them as required.

Precautions for active maintenance of the link card

- If the link card is mounted on the SPARC M10-1, active maintenance cannot be performed. Perform maintenance with the system stopped.
- If the SPARC M10-4 or SPARC M10-4S is in a single-unit configuration and the setting for the direct I/O function is enabled, active maintenance of the link card cannot be performed. Perform maintenance with the system stopped.
- If the setting for the direct I/O function is enabled in a building block configuration, active maintenance using PHP cannot be performed. Perform active maintenance using physical partition dynamic reconfiguration (DR).
- Active addition of the link card using PHP is supported by Oracle Solaris 11.2 SRU11.2.2.8.0 or later.

The following patterns are available for active maintenance of the link card.

- Active replacement (replacing the link card using PHP)
- Active replacement (replacing the link card using DR)
- Active addition (installing the link card using PHP)
- Active addition (installing the link card using DR)
- Active removal (removing the link card using PHP)
- Active removal (removing the link card using DR)

Active replacement (replacing the link card using PHP)

Use the PCI hot plug (PHP) to release the link card mounted on a server from the system.
This can be done only when the link card is mounted on the SPARC M10-4/M10-4S and the setting for the direct I/O function is disabled.

Figure 7-14 Active replacement flow (replacing the link card using PHP)

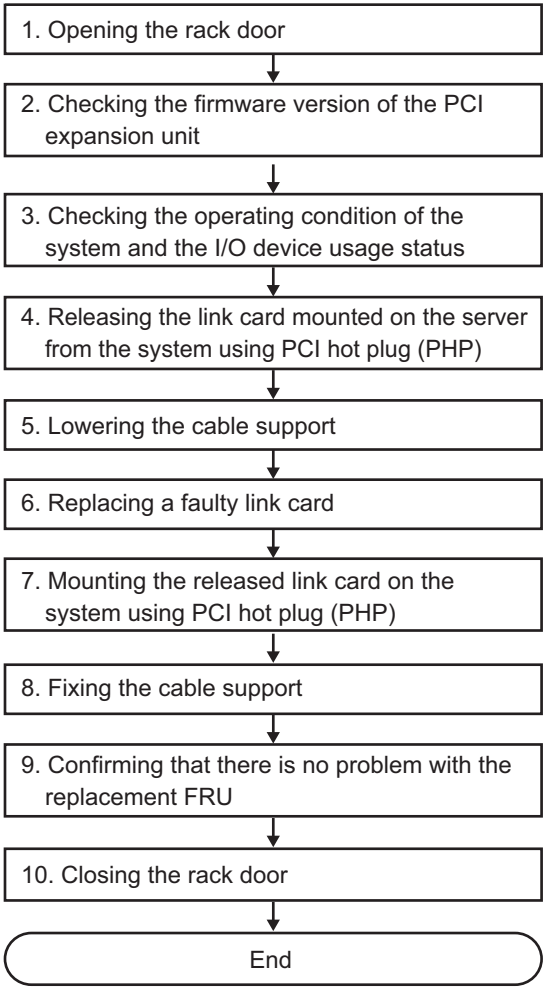

1. Opening the rack door
2. Checking the firmware version of the PCI expansion unit
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the link card mounted on the server from the system using PCI hot plug (PHP)
5. Lowering the cable support
6. Replacing a faulty link card
7. Mounting the released link card on the system using PCI hot plug (PHP)
8. Fixing the cable support
9. Confirming that there is no problem with the replacement FRU
10. Closing the rack door
End

Table 7-16 Active replacement work procedure (replacing the link card using PHP)

Item	Task	Reference
1	Opening the rack door	
2	Checking the firmware version of the PCI expansion unit	"5.3 Checking the Firmware Version of the PCI Expansion Unit"
3	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
4	Releasing the link card mounted on the server from the system using PCI hot plug (PHP)	"5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)"
5	Lowering the cable support	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Replacing a faulty link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Mounting the released link card on the system using PCI hot plug (PHP)	"6.3.1 Mounting a link card using PCI hot plug (PHP)"
8	Fixing the cable support	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
9	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
10	Closing the rack door	

Active replacement (replacing the link card using DR)

Release the link card mounted on the destination server from the system using physical partition dynamic reconfiguration (DR).
This can be done only when the link card is mounted on the M10-4S and the system is in a building block configuration of the SPARC M10-4S.

Figure 7-15 Active replacement flow (replacing the link card using DR)

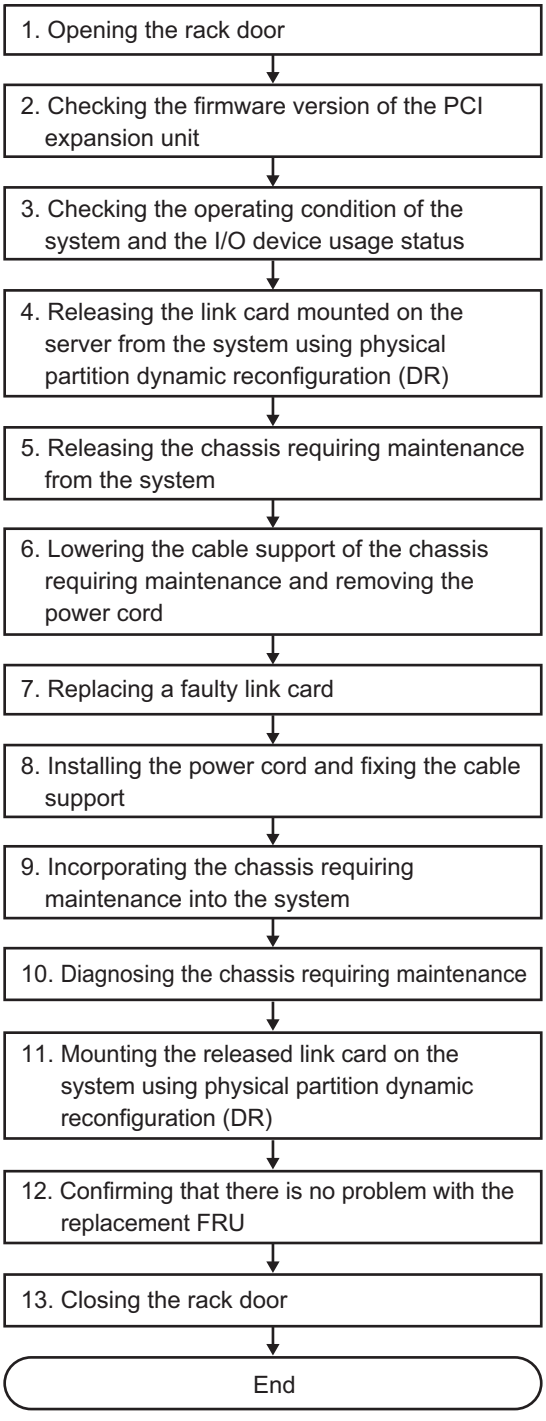

1. Opening the rack door
2. Checking the firmware version of the PCI expansion unit
3. Checking the operating condition of the system and the I/O device usage status
4. Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)
5. Releasing the chassis requiring maintenance from the system
6. Lowering the cable support of the chassis requiring maintenance and removing the power cord
7. Replacing a faulty link card
8. Installing the power cord and fixing the cable support
9. Incorporating the chassis requiring maintenance into the system
10. Diagnosing the chassis requiring maintenance
11. Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)
12. Confirming that there is no problem with the replacement FRU
13. Closing the rack door
End

Table 7-17 Active replacement work procedure (replacing the link card using DR)

Item	Task	Reference
1	Opening the rack door	
2	Checking the firmware version of the PCI expansion unit	"5.3 Checking the Firmware Version of the PCI Expansion Unit"
3	Checking the operating condition of the system and the I/O device usage status	"5.4 Checking the Operating Condition and Resource Usage Status"
4	Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)	"5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)"
5	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Lowering the cable support of the chassis requiring maintenance and removing the power cord	"5.9 Accessing an FRU" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Replacing a faulty link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Installing the power cord and fixing the cable support	"6.1 Restoring the Chassis" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
9	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
10	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
11	Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)	"6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)"
12	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
13	Closing the rack door	

Active addition (installing the link card using PHP)

Installing a link card to the server using PCI hot plug (PHP)
This can be done only when the server on which the link card is to be installed is a SPARC M10-4/M10-4S and the setting for the direct I/O function is disabled.

Note - Active addition of the link card using PHP is supported by Oracle Solaris 11.2 SRU11.2.2.8.0 or later.

Figure 7-16 Active addition flow (installing the link card using PHP)

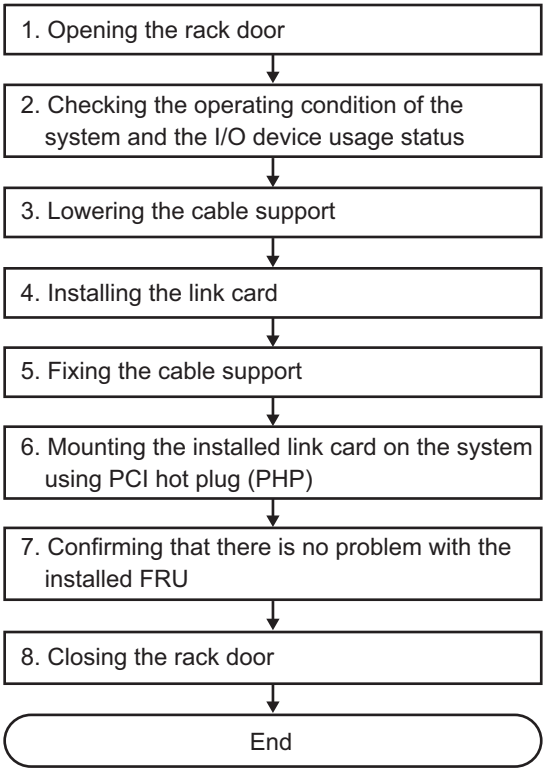

1. Opening the rack door
2. Checking the operating condition of the system and the I/O device usage status
3. Lowering the cable support
4. Installing the link card
5. Fixing the cable support
6. Mounting the installed link card on the system using PCI hot plug (PHP)
7. Confirming that there is no problem with the installed FRU
8. Closing the rack door
End

Table 7-18 Active addition work procedure (installing the link card using PHP)

Item	Task	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
3	Lowering the cable support	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
4	Installing the link card (*1)	"10.4 Installing the Link Card"
5	Fixing the cable support	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Mounting the installed link card on the system using PCI hot plug (PHP)	"6.3.1 Mounting a link card using PCI hot plug (PHP)"
7	Confirming that there is no problem with the installed FRU	"6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Closing the rack door	

*1 For details on the work for installing a PCI expansion unit, see the *Fujitsu M10/SPARC M10 Systems Installation Guide*.

Active addition (installing the link card using DR)

Installing the link card on the server using physical partition dynamic reconfiguration (DR)
This can be done only when the server on which the link card is to be installed has the building block configuration of the SPARC M10-4S.

Figure 7-17 Active addition flow (installing the link card using DR)

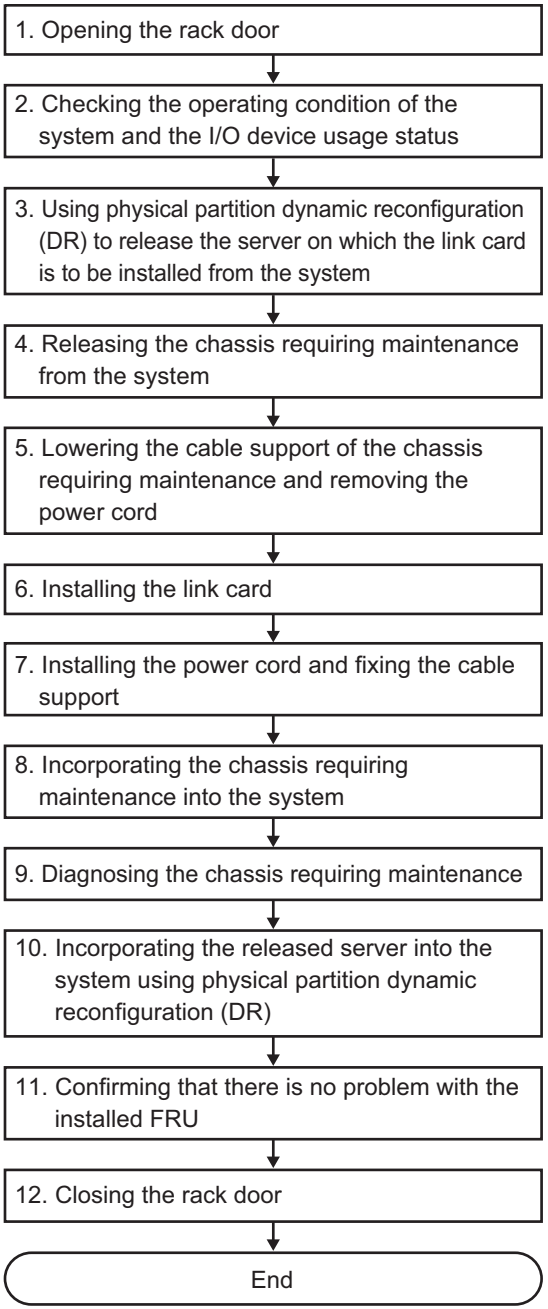

1. Opening the rack door
2. Checking the operating condition of the system and the I/O device usage status
3. Using physical partition dynamic reconfiguration (DR) to release the server on which the link card is to be installed from the system
4. Releasing the chassis requiring maintenance from the system
5. Lowering the cable support of the chassis requiring maintenance and removing the power cord
6. Installing the link card
7. Installing the power cord and fixing the cable support
8. Incorporating the chassis requiring maintenance into the system
9. Diagnosing the chassis requiring maintenance
10. Incorporating the released server into the system using physical partition dynamic reconfiguration (DR)
11. Confirming that there is no problem with the installed FRU
12. Closing the rack door
End

Table 7-19 Active addition work procedure (installing the link card using DR)

Item	Task	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.4 Checking the Operating Condition and Resource Usage Status"
3	Using physical partition dynamic reconfiguration (DR) to release the server on which the link card is to be installed from the system	"5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)"
4	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
5	Lowering the cable support of the chassis requiring maintenance and removing the power cord	"5.9 Accessing an FRU" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Installing the link card (*1)	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Installing the power cord and fixing the cable support	"6.1 Restoring the Chassis" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
9	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/ Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
10	Incorporating the released server into the system using physical partition dynamic reconfiguration (DR)	"6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)"
11	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
12	Closing the rack door	

*1 For details on the work for installing a PCI expansion unit, see the *Fujitsu M10/SPARC M10 Systems Installation Guide*.

Active removal (removing the link card using PHP)

Use the PCI hot plug (PHP) to release the link card mounted on a server from the system.
This can be done only when the link card is mounted on the SPARC M10-4/M10-4S and the setting for the direct I/O function is disabled.

Figure 7-18 Active removal flow (removing the link card using PHP)

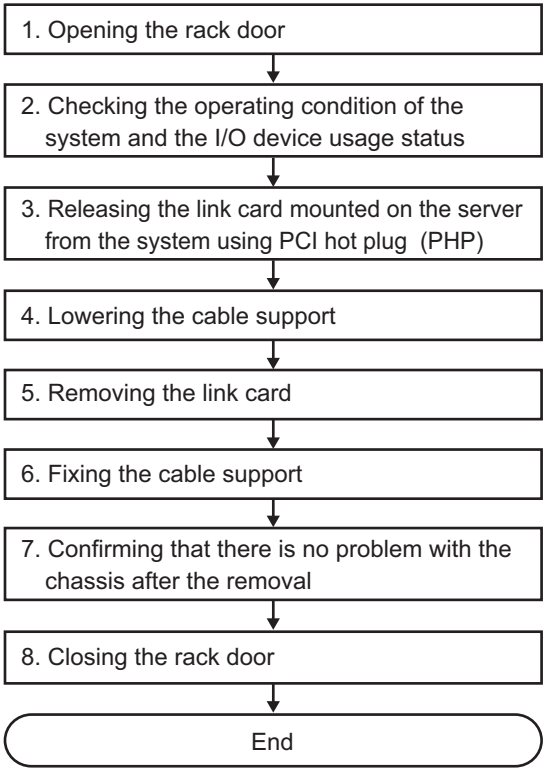

1. Opening the rack door
2. Checking the operating condition of the system and the I/O device usage status
3. Releasing the link card mounted on the server from the system using PCI hot plug (PHP)
4. Lowering the cable support
5. Removing the link card
6. Fixing the cable support
7. Confirming that there is no problem with the chassis after the removal
8. Closing the rack door
End

Table 7-20 Active removal work procedure (removing the link card using PHP)

Item	Task	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain" "5.4.2 Checking the assignment status of I/O devices"
3	Releasing the link card mounted on the server from the system using PCI hot plug (PHP)	"5.5.1 Releasing the link card or PCIe card using PCI hot plug (PHP)"
4	Lowering the cable support	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
5	Removing the link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Fixing the cable support	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Confirming that there is no problem with the chassis after the removal	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Closing the rack door	

Active removal (removing the link card using DR)

Release the link card mounted on the destination server from the system using physical partition dynamic reconfiguration (DR).
This can be done only when the link card is mounted on the M10-4S and the system is in a building block configuration of the SPARC M10-4S.

Figure 7-19 Active replacement flow (replacing the link card using DR)

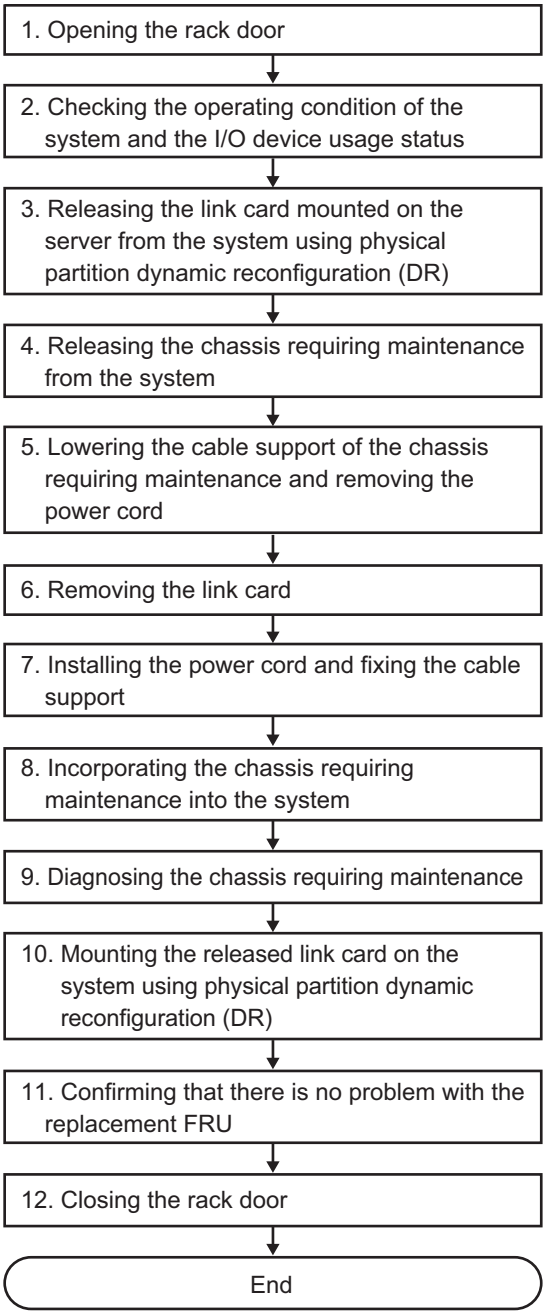

1. Opening the rack door
2. Checking the operating condition of the system and the I/O device usage status
3. Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)
4. Releasing the chassis requiring maintenance from the system
5. Lowering the cable support of the chassis requiring maintenance and removing the power cord
6. Removing the link card
7. Installing the power cord and fixing the cable support
8. Incorporating the chassis requiring maintenance into the system
9. Diagnosing the chassis requiring maintenance
10. Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)
11. Confirming that there is no problem with the replacement FRU
12. Closing the rack door
End

Table 7-21 Active removal work procedure (removing the link card using DR)

Item	Task	Reference
1	Opening the rack door	
2	Checking the operating condition of the system and the I/O device usage status	"5.4 Checking the Operating Condition and Resource Usage Status"
3	Releasing the link card mounted on the server from the system using physical partition dynamic reconfiguration (DR)	"5.5.2 Releasing the link card or PCIe card using physical partition dynamic reconfiguration (DR)"
4	Releasing the chassis requiring maintenance from the system	"5.8.1 Releasing of the SPARC M10-4S chassis (possible only in a system with a building block configuration)" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
5	Lowering the cable support of the chassis requiring maintenance and removing the power cord	"5.9 Accessing an FRU" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Removing the link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Installing the power cord and fixing the cable support	"6.1 Restoring the Chassis" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Incorporating the chassis requiring maintenance into the system	"6.2.1 Incorporation of the SPARC M10-4S chassis (possible only in a system with a building block configuration)" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
9	Diagnosing the chassis requiring maintenance	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
10	Mounting the released link card on the system using physical partition dynamic reconfiguration (DR)	"6.3.2 Mounting the link card on the server using physical partition dynamic reconfiguration (DR)"
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
12	Closing the rack door	

7.4.2 Inactive maintenance

You can perform inactive maintenance only for a system that uses the SPARC M10-4S in a building block configuration.
This section describes the flows of the inactive replacement, inactive addition, and inactive removal for the link card.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

The following patterns are available for inactive maintenance of the link card.

- Inactive replacement (link card replacement with the physical partition stopped)
- Inactive addition (link card installation with the physical partition stopped)
- Inactive removal (link card removal with the physical partition stopped)

Inactive replacement (link card replacement with the physical partition stopped)

Stop the physical partition in which the link card requiring maintenance is mounted, and then replace the link card.

Figure 7-20 Inactive replacement flow (link card replacement with the physical partition stopped)

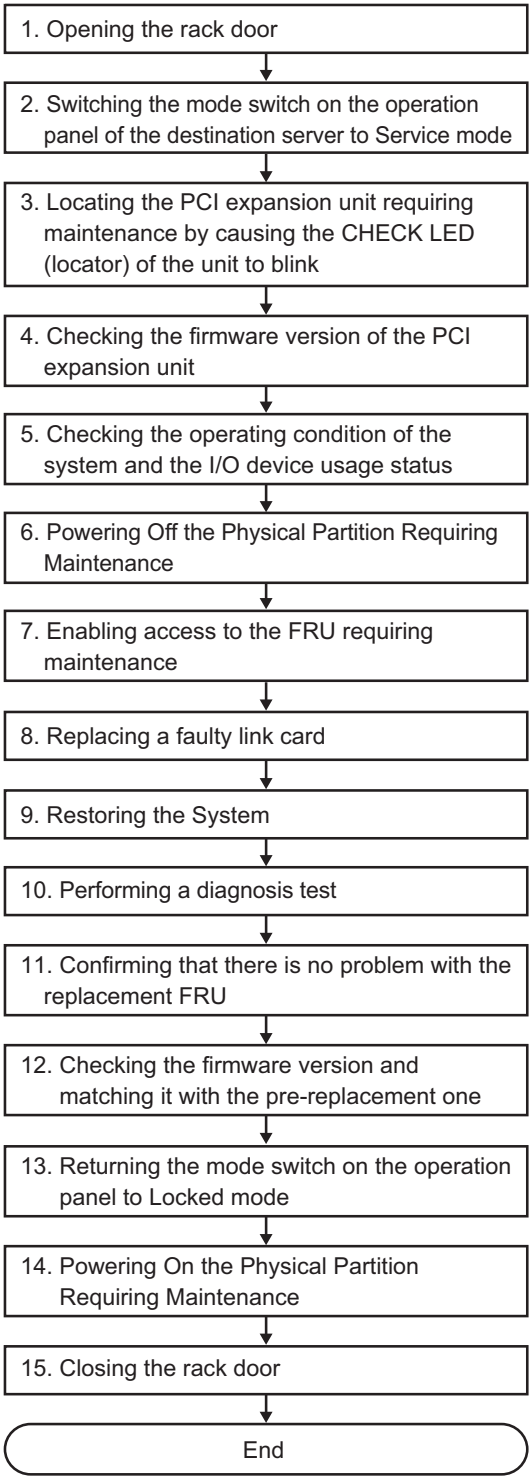

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the firmware version of the PCI expansion unit
5. Checking the operating condition of the system and the I/O device usage status
6. Powering Off the Physical Partition Requiring Maintenance
7. Enabling access to the FRU requiring maintenance
8. Replacing a faulty link card
9. Restoring the System
10. Performing a diagnosis test
11. Confirming that there is no problem with the replacement FRU
12. Checking the firmware version and matching it with the pre-replacement one
13. Returning the mode switch on the operation panel to Locked mode
14. Powering On the Physical Partition Requiring Maintenance
15. Closing the rack door
End

Table 7-22 Inactive replacement work procedure (link card replacement with the physical partition stopped)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the firmware version of the PCI expansion unit	"5.3 Checking the Firmware Version of the PCI Expansion Unit"
5	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
6	Powering Off the Physical Partition Requiring Maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Enabling access to the FRU requiring maintenance	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/ Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Replacing a faulty link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
9	Restoring the System	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
10	Performing a diagnosis test	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/ Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
11	Confirming that there is no problem with the replacement FRU	"6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
12	Checking the firmware version and matching it with the pre-replacement one	"6.6 Updating the Firmware of the PCI Expansion Unit"
13	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
14	Powering On the Physical Partition Requiring Maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
15	Closing the rack door	

Inactive addition (link card installation with the physical partition stopped)

Stop the physical partition in which the link card is to be installed, and then mount the link card.

Figure 7-21 Inactive addition flow (link card installation with the physical partition stopped)

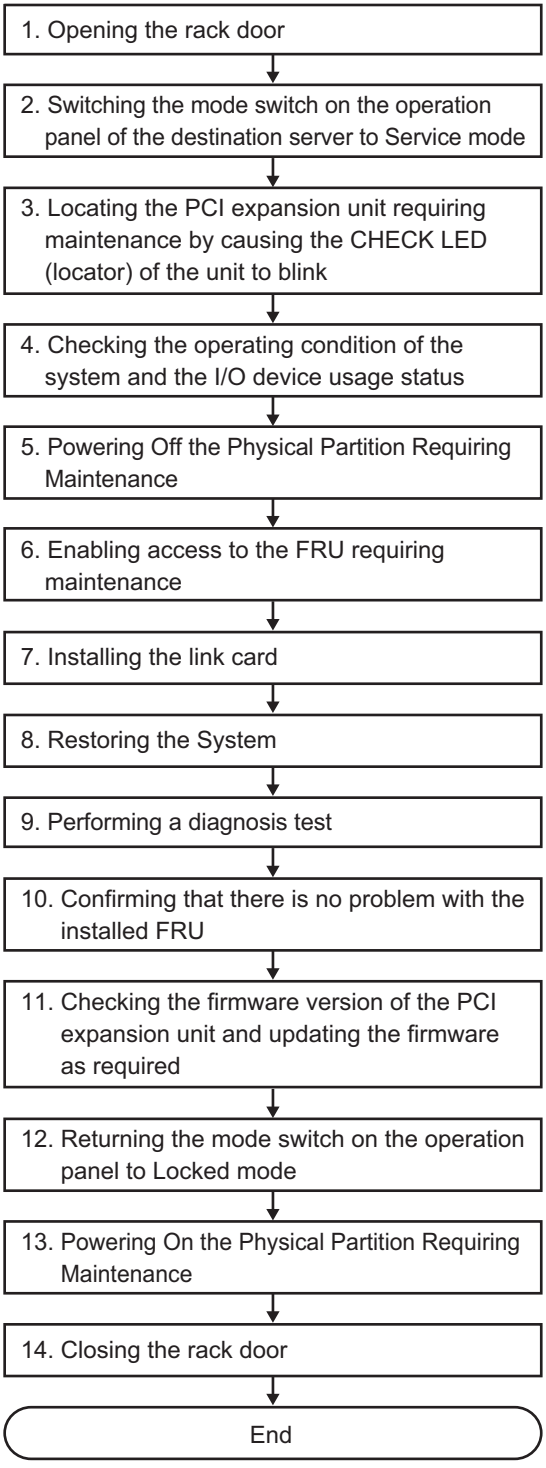

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the operating condition of the system and the I/O device usage status
5. Powering Off the Physical Partition Requiring Maintenance
6. Enabling access to the FRU requiring maintenance
7. Installing the link card
8. Restoring the System
9. Performing a diagnosis test
10. Confirming that there is no problem with the installed FRU
11. Checking the firmware version of the PCI expansion unit and updating the firmware as required
12. Returning the mode switch on the operation panel to Locked mode
13. Powering On the Physical Partition Requiring Maintenance
14. Closing the rack door
End

Table 7-23 Inactive addition work procedure (link card installation with the physical partition stopped)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
5	Powering Off the Physical Partition Requiring Maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Enabling access to the FRU requiring maintenance	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Installing the link card (*1)	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Restoring the System	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
9	Performing a diagnosis test	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
10	Confirming that there is no problem with the installed FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
11	Checking the firmware version of the PCI expansion unit and updating the firmware as required	"6.6 Updating the Firmware of the PCI Expansion Unit"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
13	Powering On the Physical Partition Requiring Maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
14	Closing the rack door	

*1 For details on the work for installing a PCI expansion unit, see the *Fujitsu M10/SPARC M10 Systems Installation Guide*.

Inactive removal (link card removal with the physical partition stopped)

Stop the physical partition from which the link card is to be removed, and then remove the link card.

Figure 7-22 Inactive removal flow (link card removal with the physical partition stopped)

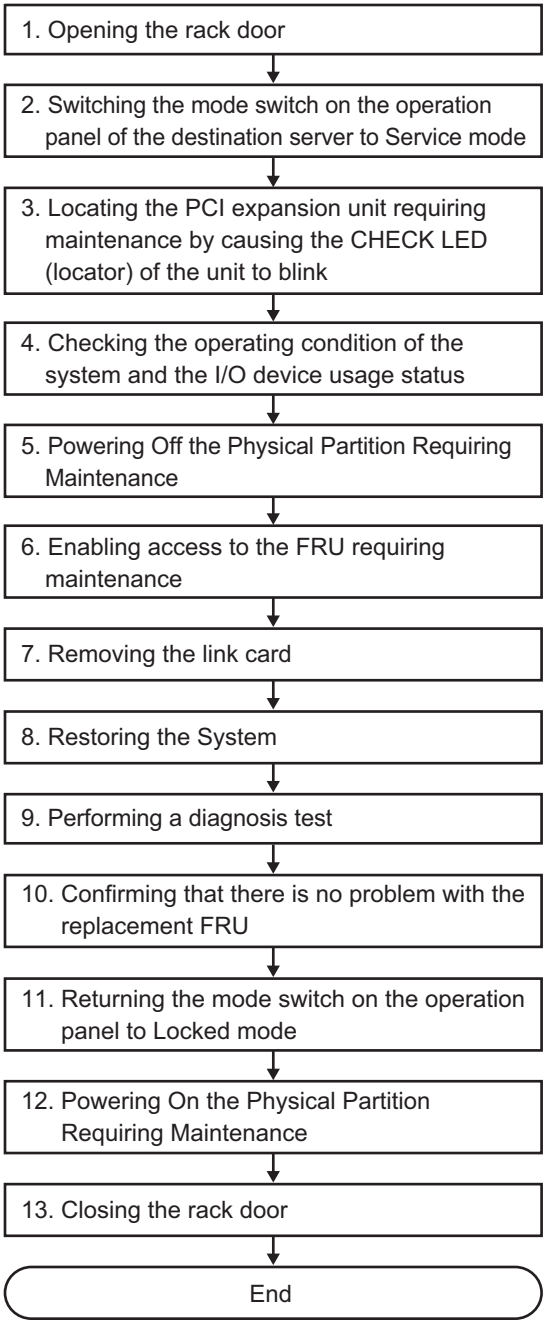

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the operating condition of the system and the I/O device usage status
5. Powering Off the Physical Partition Requiring Maintenance
6. Enabling access to the FRU requiring maintenance
7. Removing the link card
8. Restoring the System
9. Performing a diagnosis test
10. Confirming that there is no problem with the replacement FRU
11. Returning the mode switch on the operation panel to Locked mode
12. Powering On the Physical Partition Requiring Maintenance
13. Closing the rack door
End

Table 7-24 Inactive removal work procedure (link card removal with the physical partition stopped)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
5	Powering Off the Physical Partition Requiring Maintenance	"5.5 Powering Off the Physical Partition Requiring Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
6	Enabling access to the FRU requiring maintenance	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
7	Removing the link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
8	Restoring the System	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
9	Performing a diagnosis test	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
10	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
11	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
12	Powering On the Physical Partition Requiring Maintenance	"6.7 Powering On the Physical Partition Requiring Maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*
13	Closing the rack door	

7.4.3 Maintenance with the system stopped

This section describes the flows of the system-stopped replacement, system-stopped addition, and system-stopped removal for the link card.
References to detailed descriptions are written in the work procedure tables. See any of them as required.

The following patterns are available for system-stopped replacement of the link card.

- Cold replacement (replacing the link card after stopping the system)

- Cold addition (installing the link card after stopping the system)
- Cold removal (removing the link card after stopping the system)

Cold replacement (replacing the link card after stopping the system)

Stop the system in which the link card requiring maintenance is mounted, and then replace the link card.

Figure 7-23 Cold replacement flow (replacing the link card after stopping the system)

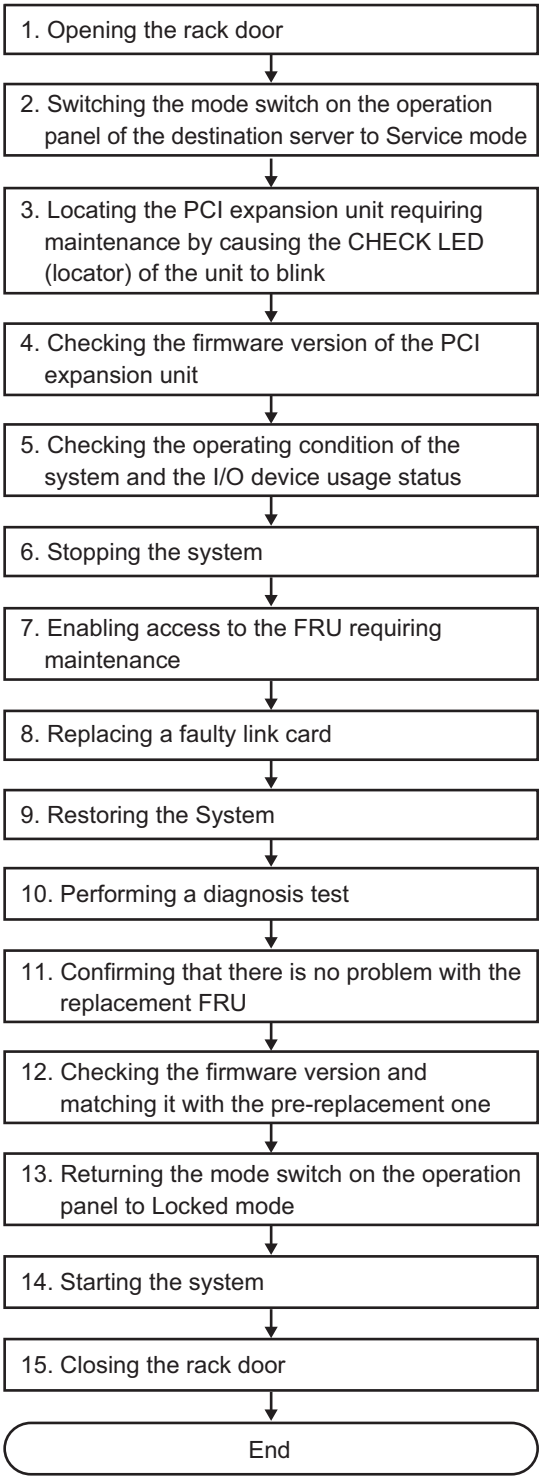

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the firmware version of the PCI expansion unit
5. Checking the operating condition of the system and the I/O device usage status
6. Stopping the system
7. Enabling access to the FRU requiring maintenance
8. Replacing a faulty link card
9. Restoring the System
10. Performing a diagnosis test
11. Confirming that there is no problem with the replacement FRU
12. Checking the firmware version and matching it with the pre-replacement one
13. Returning the mode switch on the operation panel to Locked mode
14. Starting the system
15. Closing the rack door
End

Table 7-25 Cold replacement work procedure (replacing the link card after stopping the system)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the firmware version of the PCI expansion unit	"5.3 Checking the Firmware Version of the PCI Expansion Unit"
5	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
6	Stopping the system	"5.6 Stopping the Entire System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "5.5 Stopping the Entire System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
7	Enabling access to the FRU requiring maintenance	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "5.8.1 Removing the power cords" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
8	Replacing a faulty link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
9	Restoring the System	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.1.6 Installing the power cords" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
10	Performing a diagnosis test	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.4 Diagnosing a Replacement FRU" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
11	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
12	Checking the firmware version and matching it with the pre-replacement one	"6.6 Updating the Firmware of the PCI Expansion Unit"
13	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.8 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*

Table 7-25 Cold replacement work procedure (replacing the link card after stopping the system) *(continued)*

Item	Task	Reference
14	Starting the system	"6.8 Starting the System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.9 Starting the System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
15	Closing the rack door	

Cold addition (installing the link card after stopping the system)

Stop the system in which the link card is to be installed, and then mount the link card.

Figure 7-24 Cold addition flow (installing the link card after stopping the system)

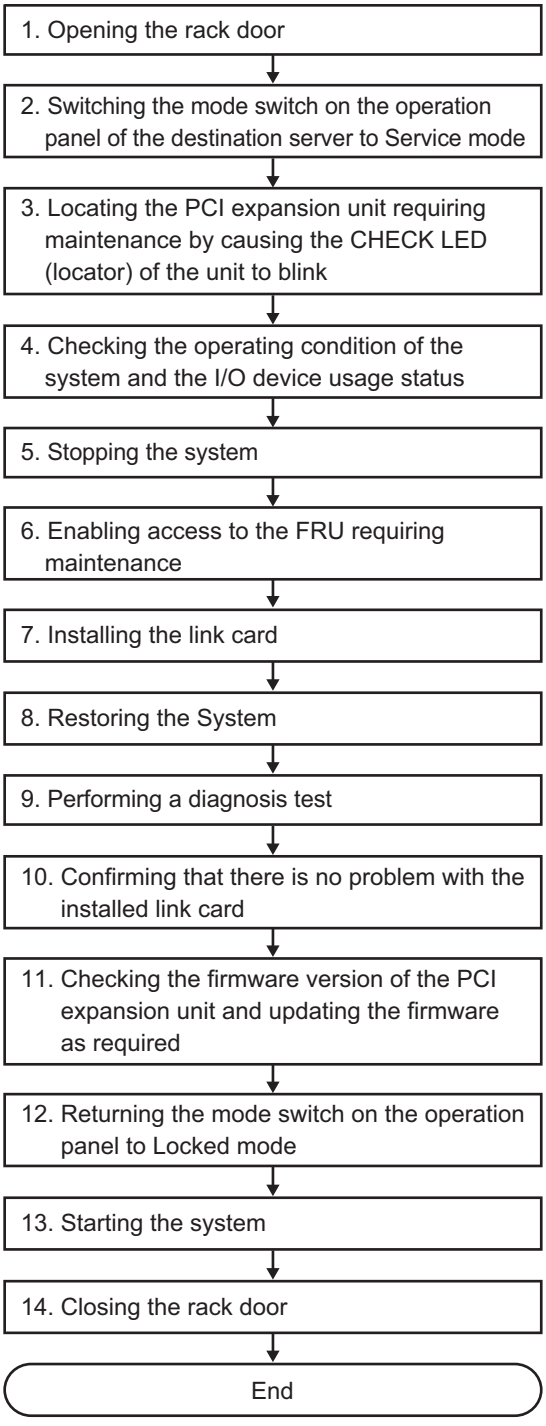

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the operating condition of the system and the I/O device usage status
5. Stopping the system
6. Enabling access to the FRU requiring maintenance
7. Installing the link card
8. Restoring the System
9. Performing a diagnosis test
10. Confirming that there is no problem with the installed link card
11. Checking the firmware version of the PCI expansion unit and updating the firmware as required
12. Returning the mode switch on the operation panel to Locked mode
13. Starting the system
14. Closing the rack door
End

Table 7-26 Cold addition work procedure (installing the link card after stopping the system)

Item	Task	Reference
1	Opening the rack door	
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
5	Stopping the system	"5.6 Stopping the Entire System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "5.5 Stopping the Entire System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
6	Enabling access to the FRU requiring maintenance	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "5.8.1 Removing the power cords" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
7	Installing the link card (*1)	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
8	Restoring the System	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.1.6 Installing the power cords" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
9	Performing a diagnosis test	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.4 Diagnosing a Replacement FRU" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
10	Confirming that there is no problem with the installed link card	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
11	Checking the firmware version of the PCI expansion unit and updating the firmware as required	"6.6 Updating the Firmware of the PCI Expansion Unit"
12	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.8 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
13	Starting the system	"6.8 Starting the System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.9 Starting the System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*

Table 7-26 Cold addition work procedure (installing the link card after stopping the system) *(continued)*

Item	Task	Reference
14	Closing the rack door	

*1 For details on the work for installing a PCI expansion unit, see the *Fujitsu M10/SPARC M10 Systems Installation Guide*.

Cold removal (removing the link card after stopping the system)

Stop the system from which the link card is to be removed, and then mount the link card.

Figure 7-25 Cold removal flow (removing the link card after stopping the system)

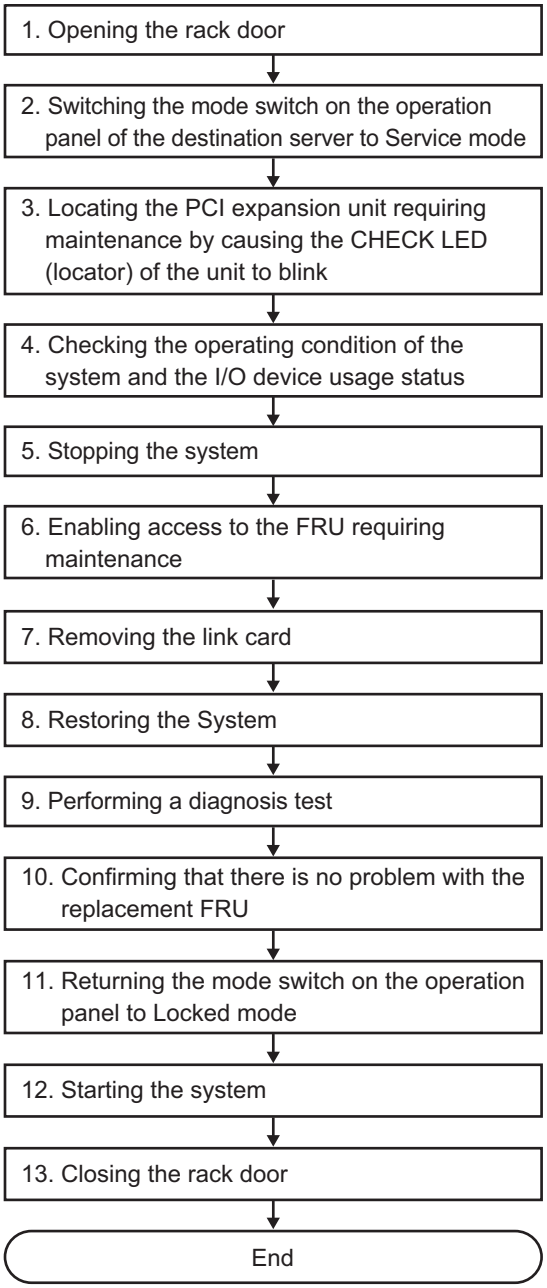

1. Opening the rack door
2. Switching the mode switch on the operation panel of the destination server to Service mode
3. Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink
4. Checking the operating condition of the system and the I/O device usage status
5. Stopping the system
6. Enabling access to the FRU requiring maintenance
7. Removing the link card
8. Restoring the System
9. Performing a diagnosis test
10. Confirming that there is no problem with the replacement FRU
11. Returning the mode switch on the operation panel to Locked mode
12. Starting the system
13. Closing the rack door
End

Table 7-27 Cold removal work procedure (removing the link card after stopping the system)

Item	Task	Reference
1	Opening the rack door	

Table 7-27 Cold removal work procedure (removing the link card after stopping the system) *(continued)*

Item	Task	Reference
2	Switching the mode switch on the operation panel of the destination server to Service mode	"5.2 Switching the Mode Switch to Service Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
3	Locating the PCI expansion unit requiring maintenance by causing the CHECK LED (locator) of the unit to blink	"5.2 Checking the PCI Expansion Unit Requiring Maintenance and the Destination Physical Partition"
4	Checking the operating condition of the system and the I/O device usage status	"5.4.1 Checking the operating condition of the physical partition or logical domain"
5	Stopping the system	"5.6 Stopping the Entire System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "5.5 Stopping the Entire System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
6	Enabling access to the FRU requiring maintenance	"5.9.2 Lowering the cable support" in the *Fujitsu M10-4/ Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "5.8.1 Removing the power cords" in the *Fujitsu M10-1/ SPARC M10-1 Service Manual*
7	Removing the link card	"Chapter 8 Maintaining the PCI Express Cards" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* or *Fujitsu M10-1/SPARC M10-1 Service Manual*
8	Restoring the System	"6.1.2 Fixing the cable support" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.1.6 Installing the power cords" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
9	Performing a diagnosis test	"6.3.1 Diagnosing the system board" in the *Fujitsu M10-4/ Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.4 Diagnosing a Replacement FRU" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
10	Confirming that there is no problem with the replacement FRU	"6.3.3 Checking the FRU status after maintenance" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.7 Checking the FRU Status after Maintenance" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
11	Returning the mode switch on the operation panel to Locked mode	"6.6 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.8 Returning the Mode Switch to Locked Mode" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
12	Starting the system	"6.8 Starting the System" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual* "6.9 Starting the System" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*
13	Closing the rack door	

Chapter 8

Maintaining the PCI Express Cards

This chapter describes the procedure for maintaining a PCI Express (PCIe) card mounted in the PCI expansion unit. PCIe cards can be replaced, installed, or removed.

- Before Maintaining a PCI Express Card
- Configuration of the PCIe Cards
- Removing a PCI Express Card
- Installing a PCI Express Card

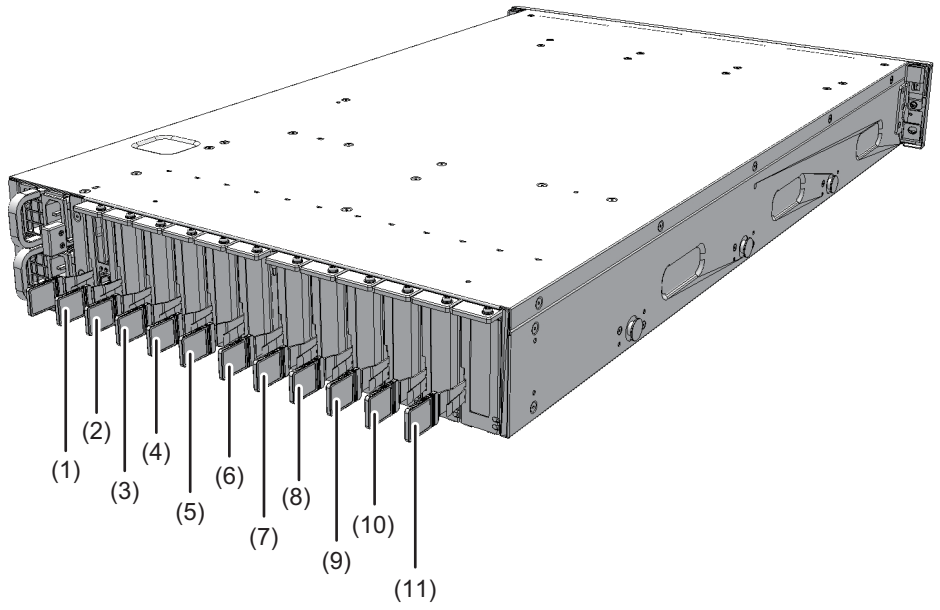
8.1 Before Maintaining a PCI Express Card

This chapter describes only the configuration, removal work, and mounting work of a PCI Express card.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the PCI Express card, see "PCI Express card" in "Table 7-2 List of available maintenance types by FRU."

8.2 Configuration of the PCIe Cards

This section describes the configuration and location of the PCIe cards.
Up to eleven (11) PCIe cards can be mounted. After maintenance, return the PCIe cards to their original mounting locations.

Figure 8-1 Location of PCIe card



Location number	Component
1	PCIe card (PCIECS#1)
2	PCIe card (PCIECS#2)
3	PCIe card (PCIECS#3)
4	PCIe card (PCIECS#4)
5	PCIe card (PCIECS#5)
6	PCIe card (PCIECS#6)
7	PCIe card (PCIECS#7)
8	PCIe card (PCIECS#8)
9	PCIe card (PCIECS#9)
10	PCIe card (PCIECS#10)
11	PCIe card (PCIECS#11)

8.3 Removing a PCI Express Card

This section describes the procedure for removing a PCIe card. Perform reduction using the same procedure.

For expansion, remove the PCIe card filler unit, rather than a PCIe card itself. Enable removal of the PCIe card before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

8.3.1 Accessing a PCI Express card cassette

1. **Remove all the cables connected to the PCIe cassette requiring maintenance.**

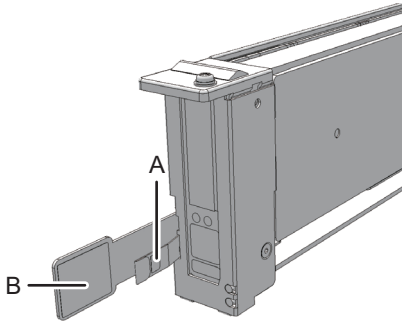
Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

8.3.2 Removing a PCI Express card cassette

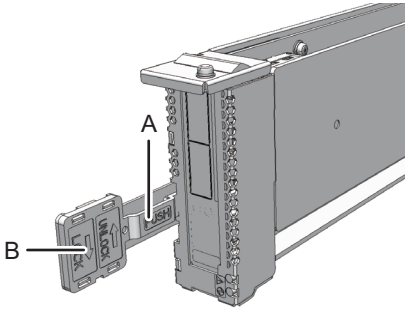
There are two types of PCIe card cassette. The shapes of the latch (A in the figure) and lever (B in the figure) vary depending on the type of the PCIe card cassette, but the same removal procedure applies. For the types of PCIe card cassettes, see "." Unless otherwise specified, the figures explained in this section use Type-1.

Figure 8-2 Types of PCIe card cassettes

Type-1

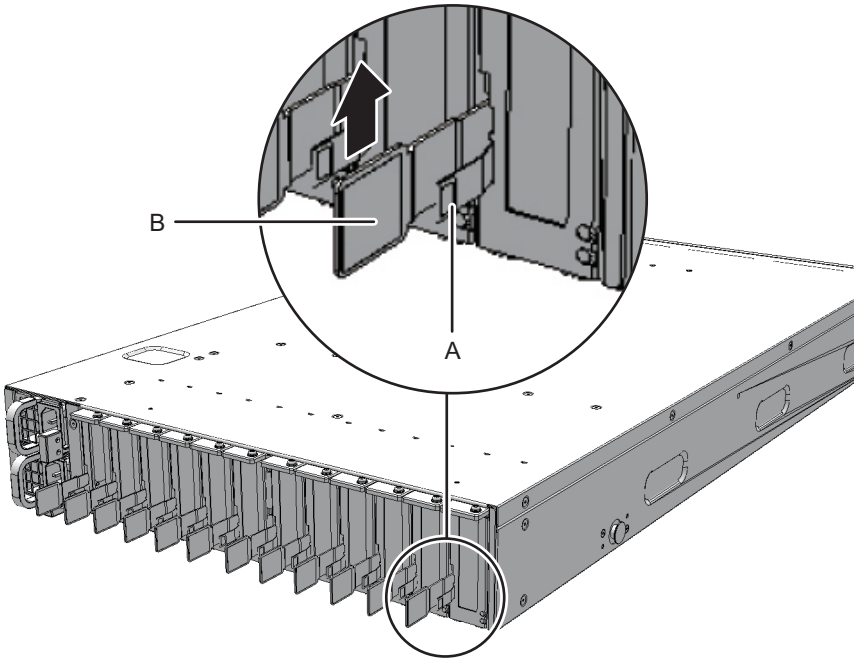


Type-2



1. **Raise the lever (B in the figure) while pressing the latch (A in the figure) of the PCIe card cassette.**

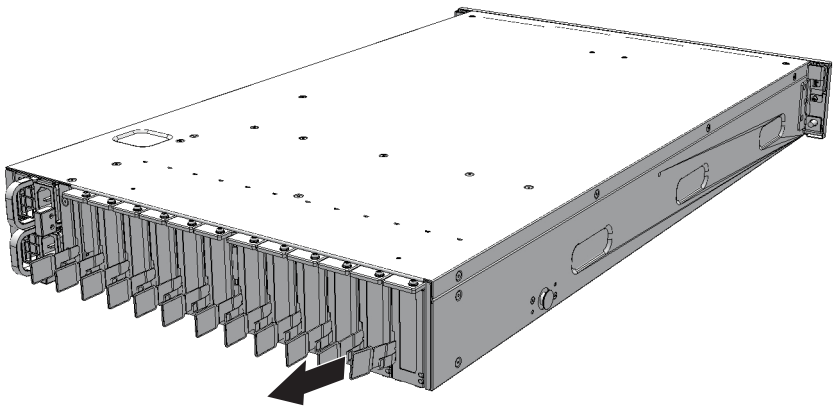
Figure 8-3 Latch and lever of the PCIe card cassette



2. **Hold the lever and carefully pull the PCIe card cassette out of the PCIe slot.**

Note - Place the removed PCIe card cassette on the grounded ESD mat to ground any static electricity.

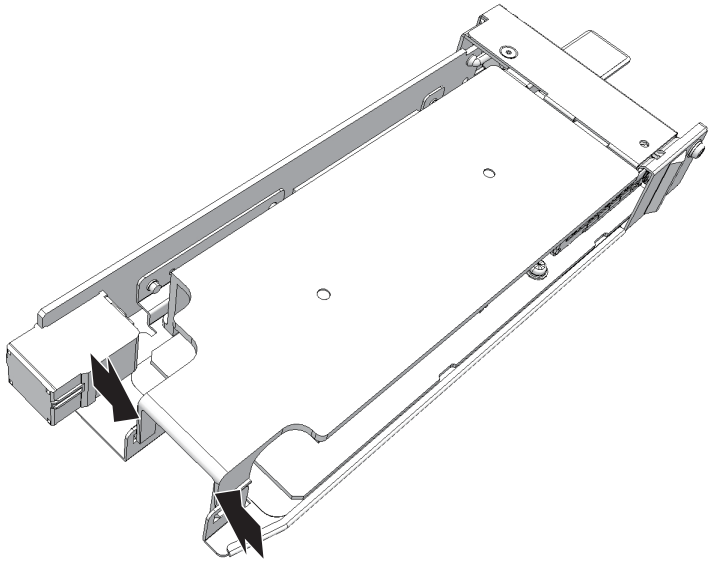
Figure 8-4 Removing the PCIe card cassette



8.3.3 Removing a PCI Express card

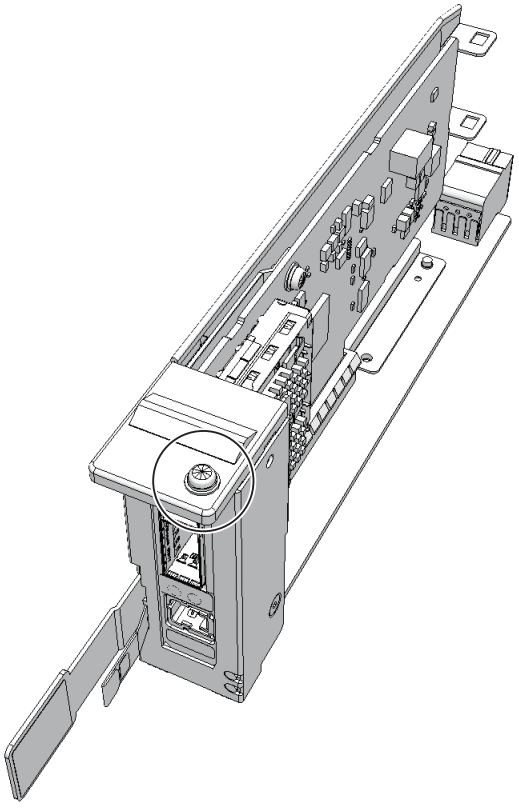
1. **While pressing the cover stop, remove the cover.**

Figure 8-5 Cover stop



2. **Remove the screw securing the PCIe card cassette and remove the bracket of the PCIe card.**

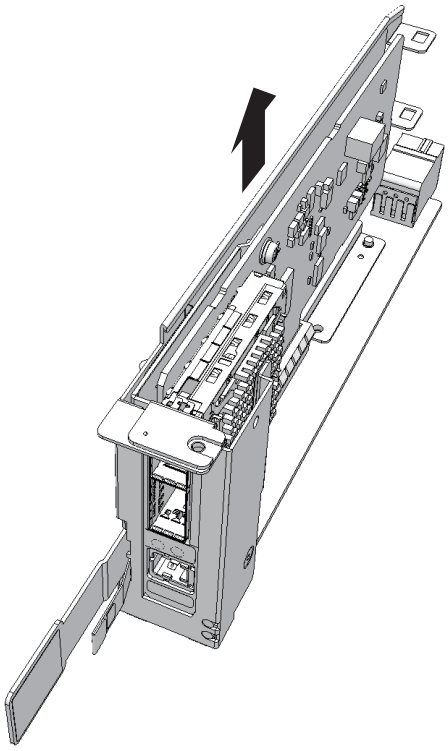
Figure 8-6 Removal of bracket



3. **Remove the PCIe card from the PCIe card cassette.**
   For expansion, you do not have to perform this step. Remove the filler unit for the PCIe card from the PCIe card cassette.

Note - Do not forcibly remove the PCIe card from the PCIe card cassette. If excessive force is used to remove the PCIe card, it may be damaged.
Note - Place the removed PCIe card on a grounded antistatic ESD mat.

Figure 8-7 PCIe card removal



8.4 Installing a PCI Express Card

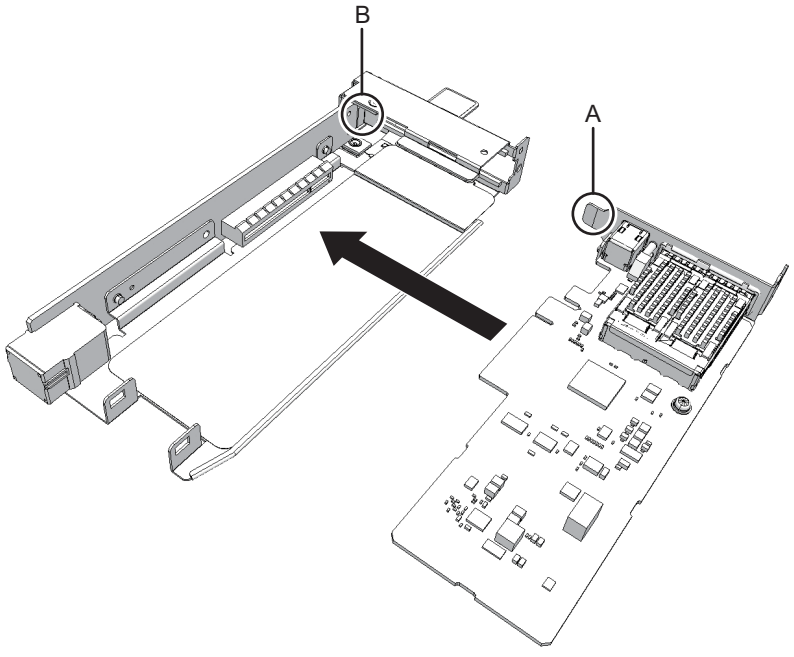
This section describes the procedure for installing a PCIe card. Perform expansion using the same procedure. For removal, install a filler unit for a PCIe card rather than a PCIe card itself.

8.4.1 Installing a PCI Express card

1. **Install the PCIe card by inserting it into the connector of the PCIe card cassette.**
   For removal, you do not have to perform this step. Mount the filler for a PCIe card in the PCIe card cassette.

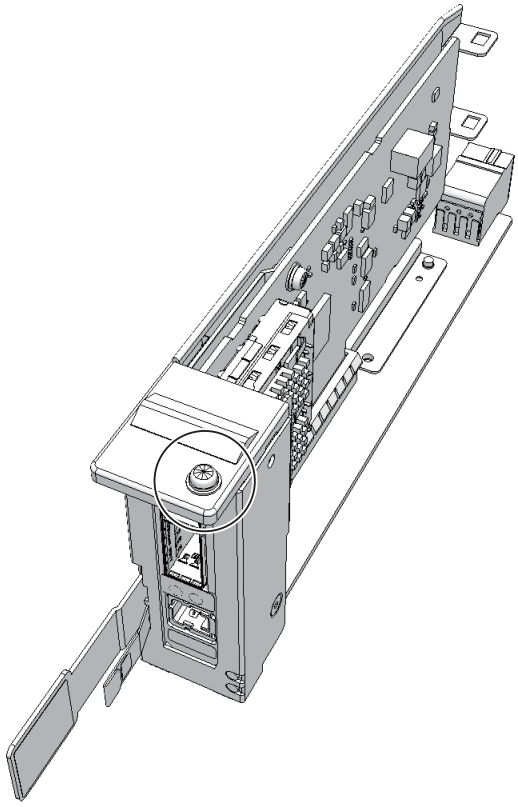
Note - Confirm that the tab of the PCIe card (A in the figure) or the tab of the filler for the PCIe card is inserted into the notch (B in the figure) of the PCIe card cassette.

Figure 8-8 Installing a PCIe card



2. **Install the bracket for the PCIe card, and then secure it with the screw.**

Figure 8-9 Installing the bracket



3. **Mount the cover on the PCIe card cassette.**

8.4.2 Installing a PCI Express card cassette

Caution - When installing a PCIe card cassette, confirm that the connectors on both the chassis and PCIe card cassette do not have any bent pins, and that the pins are aligned correctly. If you attempt to install a PCIe card cassette while any of the connector pins are bent, the chassis or the PCIe card cassette may be damaged. When performing installation, perform the work carefully so as not to bend any pins.

1. **Hold the lever of the PCIe card cassette and carefully insert the cassette into the PC slot.**

Note - Slide the PCIe card cassette along the rail at the bottom of the PCIe slot.
Note - Do not forcibly push the PCIe card cassette into the PCI slot. Using excessive force may damage the component or the chassis.

2. **Lower the lever while pressing the latch of the PCIe card cassette to secure it.**

Note - Confirm that the PCIe card cassette is securely and correctly inserted.

8.4.3 Restoring the chassis

1. **Connect all the cables to the PCIe card cassette.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 9

Maintaining the Link Board

This chapter describes the procedure for maintaining a link board mounted in the PCI expansion unit.

- Before Maintaining a Link Board
- Configuration of the Link Board
- Removing the Link Board
- Installing the Link Board

9.1 Before Maintaining a Link Board

This chapter describes only the configuration, removal work, and mounting work of a link board.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the link board, see "Link board" in "Table 7-2 List of available maintenance types by FRU."

9.2 Configuration of the Link Board

This section describes the configuration and location of the link board.
The link board is mounted in a dedicated slot among the PCI Express (PCIe) slots.
Connect the link board to the link card mounted on the SPARC M10-1/M10-4/M10-4S with the link cables and the management cable.

Figure 9-1 Location of the link board

Location number	Component
1	Link board (LINKBD)

9.3 Removing the Link Board

This section describes the preparations that must be completed prior to removing the link board.
Enable removal of the link board before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

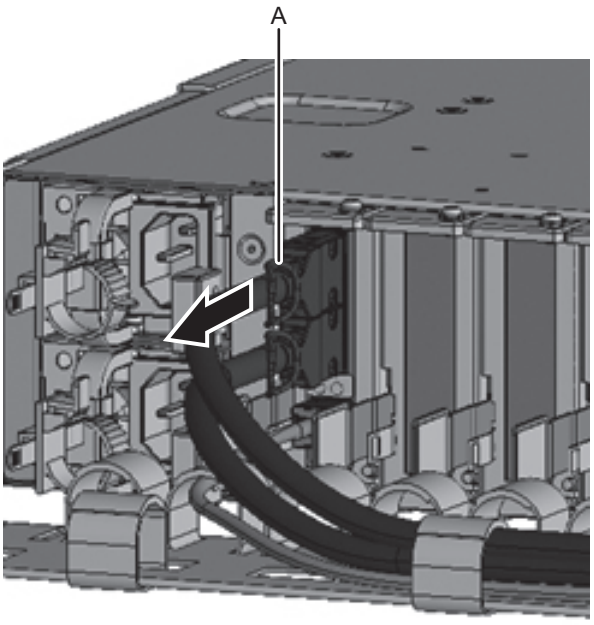
Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

9.3.1 Accessing the link board

1. **Remove the two link cables and one management cable connected to the link board requiring maintenance.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.
Note - Remove the link cable (electrical) or link cable (optical) by holding the tab (A in the figure) of the cable and pulling it straight toward the cable itself. At this time, do not hold the cable part when pulling out the crossbar cable. Pulling the cable part without the connector lock completely released may cause damage.

Figure 9-2 Removing the link cable

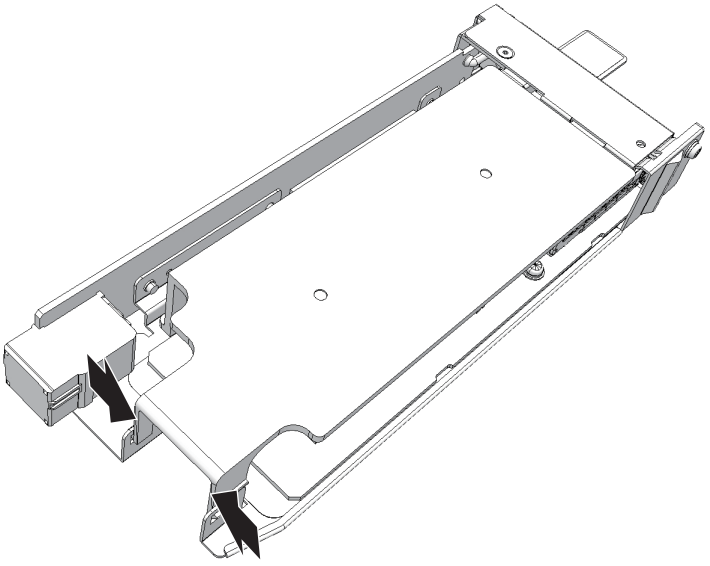


2. **Remove the PCIe card cassette.**
   For details, see "8.3.2 Removing a PCI Express card cassette."

9.3.2 Removing the link board

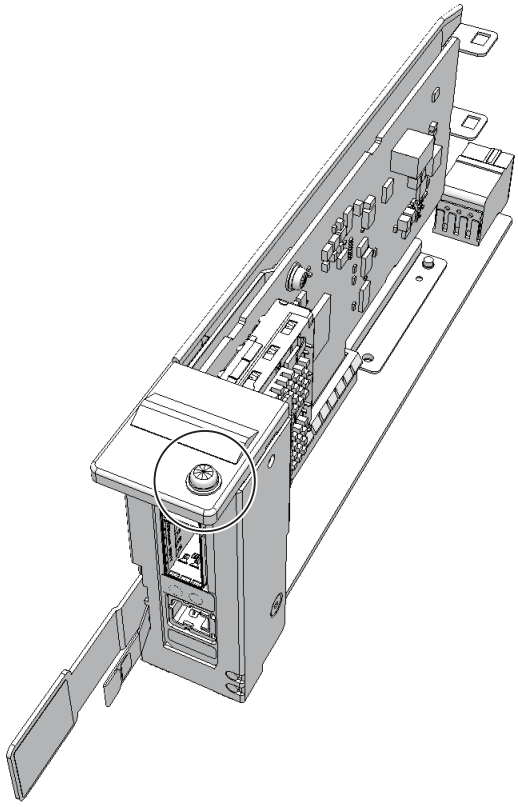
1. **While holding down the cover stopper, lift the cover away.**

Figure 9-3 Cover stop



2. **Remove the screw securing the PCIe card cassette, and then remove the bracket of the link board.**

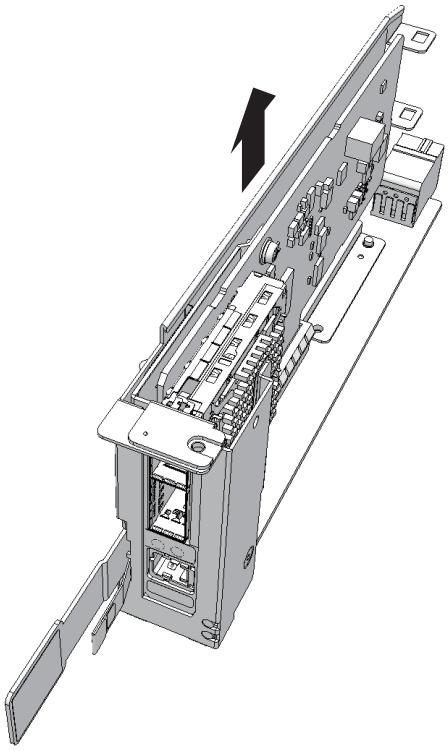
Figure 9-4 Removing the bracket



3. **Remove the link board from the PCIe card cassette.**

Note - Do not use excessive force to remove the link board from the PCIe card cassette. The use of excessive force could damage the link board.
Note - Place the removed link board on the ESD mat to ground any static electricity.

Figure 9-5 Link board removal



9.4 Installing the Link Board

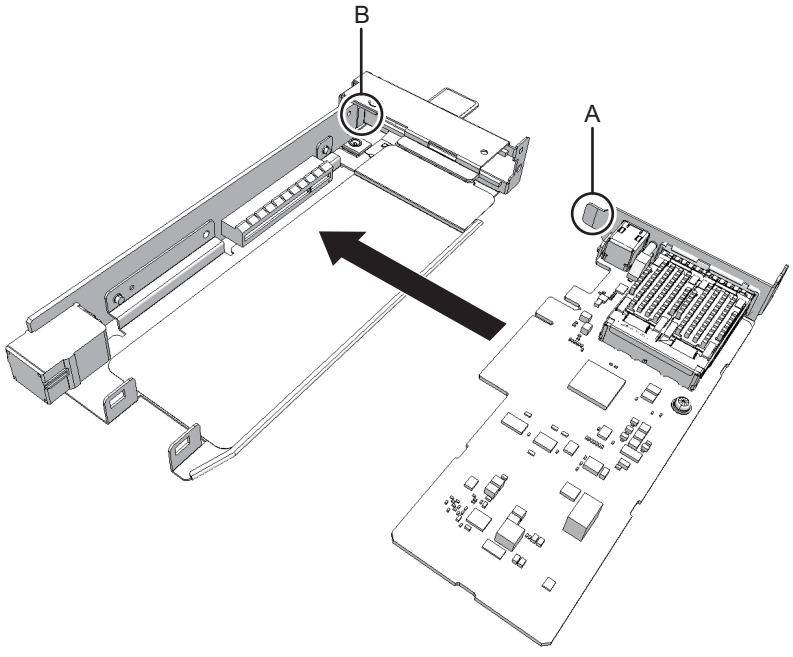
This section describes the procedure for installing the link board.

9.4.1 Installing the link board

1. **Install the link board by inserting it into the connector of the PCIe card cassette.**

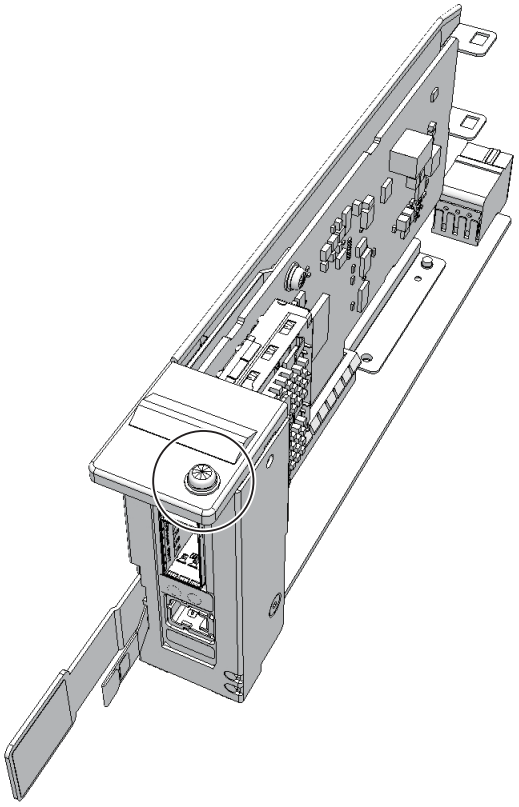
Note - Confirm that the tab of the link board (A in the figure) is inserted into the notch (B in the figure) of the PCIe card cassette.

Figure 9-6 Link board installation



2. **Secure the bracket of the link board with the screw.**

Figure 9-7 Installing the bracket



3. **Mount the cover on the PCIe card cassette.**

9.4.2 Restoring the chassis

1. **Install the PCIe card cassette.**
   For details, see "8.4.2 Installing a PCI Express card cassette."
2. **Connect the two link cables and one management cable.**

Note - Connect the cables in their original positions by referring to the notes that you made before the start of maintenance.
Note - Insert the link cable (electrical) or link cable (optical) by holding the connector part of the cable and inserting it straight into the opening. Do not hold the cable part when inserting the cable.

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 10

Maintaining the Link Cards

This chapter describes the procedure for maintaining a link card mounted in the PCI expansion unit. Link cards can be replaced, expanded, and removed.

- Before Maintaining a Link Card
- Configuration of a Link Card
- Removing the Link Card
- Installing the Link Card

10.1 Before Maintaining a Link Card

This chapter describes only the configuration, removal work, and mounting work of a link card.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the link card, see "Link card" in "Table 7-2 List of available maintenance types by FRU."

10.2 Configuration of a Link Card

This section describes the configuration and location of the link cards.
Mount a link card in the PCI Express (PCIe) slot of the SPARC M10-1 or SPARC M10-4/M10-4S and then, for each link card, connect one PCI expansion unit to add a PCIe slot. In the case of the SPARC M10-1, up to two link cards can be mounted; up to six for the SPARC M10-4, and up to five for the SPARC M10-4S.

Figure 10-1 Link card mounting position (SPARC M10-1)

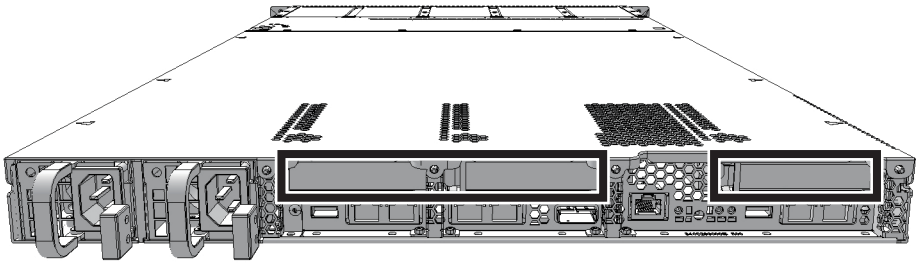
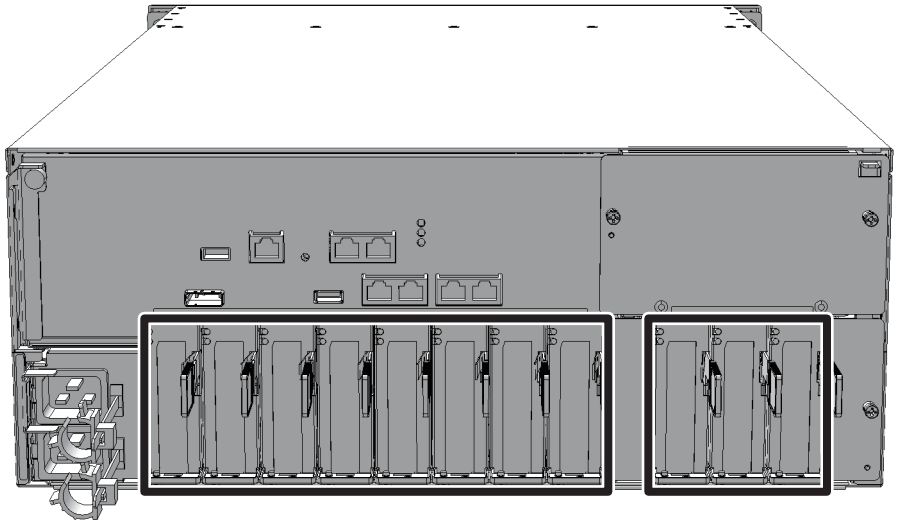
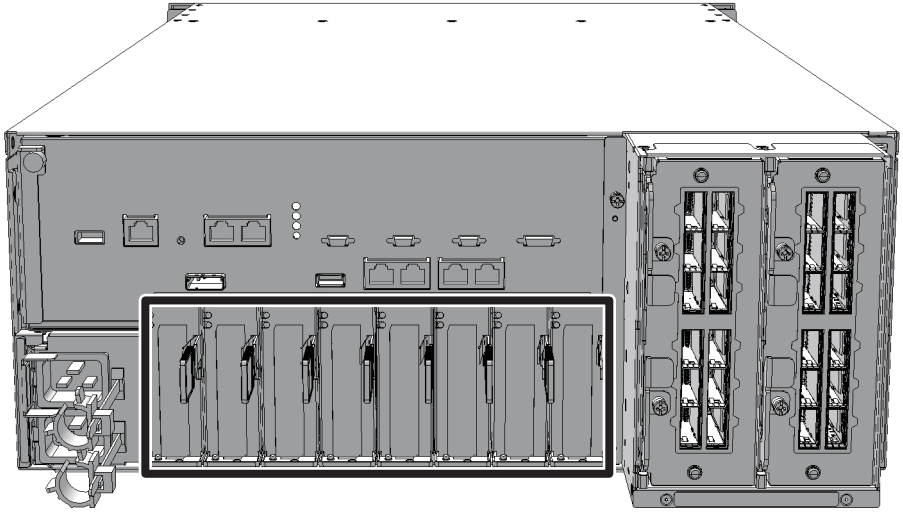


Figure 10-2 Link card mounting position (SPARC M10-4/M10-4S)

SPARC M10-4



SPARC M10-4S



10.3 Removing the Link Card

This section describes the preparations that must be completed prior to removing the link card.

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

1. **Remove the link card requiring maintenance from the server.**
   The removal procedure for the link card is the same as that for a PCIe card of each server.

   For details on the SPARC M10-1, see "8.3 Removing a PCI Express Card" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*.

   For details on the SPARC M10-4/M10-4S, see "8.4 Removing a PCI Express Card" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*.

10.4 Installing the Link Card

This section describes the procedure for installing the link card.

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

1. **If you use PCI hot plug (PHP) to maintain the link card, pull all the PCIe cassettes containing PCIe cards out of the PCI expansion unit.**
   a. Raise the lever of the PCIe card cassette while pushing the latch. For details, see Figure 8-3.
   b. Hold the lever and carefully pull the PCIe card cassette out of the PCIe slot.
2. **Installing the link card in a PCIe cassette.**
   The procedure for installing a link card in a PCIe cassette is the same as that for installing a PCIe card of each server.

   For details on the SPARC M10-1, see "8.4.1 Installing a PCI Express card" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*.

   For details on the SPARC M10-4/M10-4S, see "8.5.1 Installing a PCI Express card" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*.

3. **Connect the link cable and the management cable to the link card.**
4. **Install the PCIe cassette containing the link card in the server.**
   The installation procedure is the same as that for a PCIe cassette of each server.

   For details on the SPARC M10-1, see "8.4.2 Installing a PCIe riser" in the *Fujitsu M10-1/SPARC M10-1 Service Manual*.

   For details on the SPARC M10-4/M10-4S, see "8.5.3 Installing a PCI Express card cassette" in the *Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual*.

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 11

Maintaining the Link Cables

This chapter describes the maintenance procedure for the link cables.

- Before Maintaining a Link Cable
- Configuration of the Link Cable Connection Ports
- Removing a Link Cable
- Installing a Link Cable

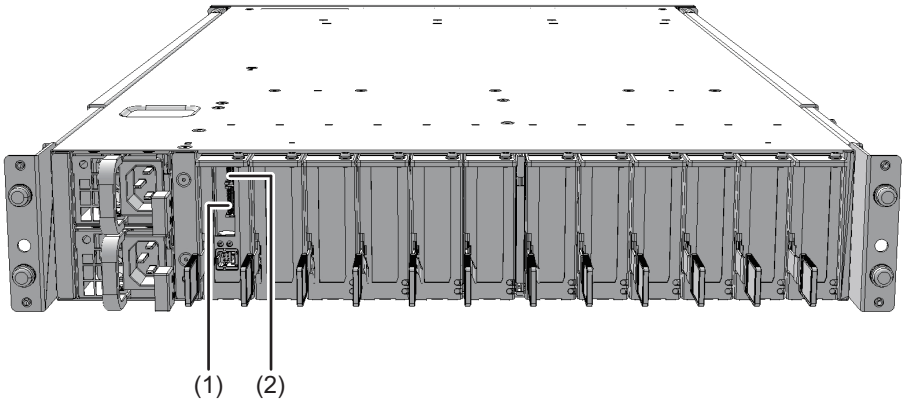
11.1 Before Maintaining a Link Cable

This chapter describes only the configuration, removal work, and mounting work of a link cable.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the link cable, see "Link cable" in "Table 7-2 List of available maintenance types by FRU."

11.2 Configuration of the Link Cable Connection Ports

This section describes the configuration and location of the link cable connection ports.
The link cards of the SPARC M10-1 or SPARC M10-4/M10-4S are connected to the link board of the PCI expansion unit with the link cables and the management cable.

Figure 11-1 Location of link cable connection ports



Location number	Component
1	Link cable (LINKCBL#0)
2	Link cable (LINKCBL#1)

11.3 Removing a Link Cable

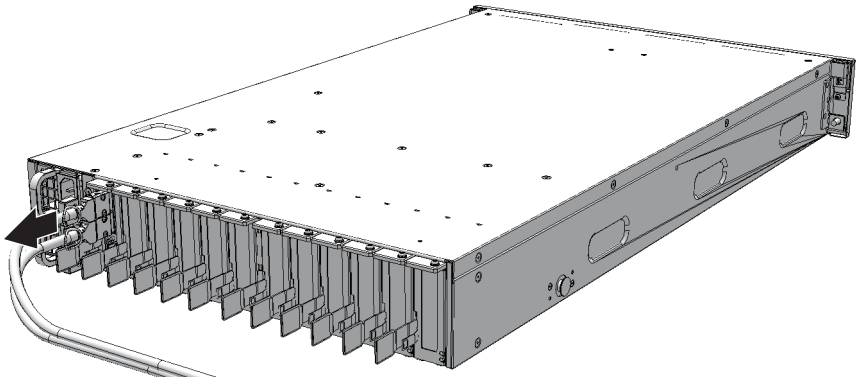
This section describes the procedure for removing a link cable.
Enable removal of the link cable before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

1. **Hold the tabs of the link cables on the PCI expansion unit side, and then remove the two cables.**

Note - Record the positions of the link cables before removing them to ensure that they are reinstalled correctly.

Figure 11-2 Removing the link cable



2. **Remove the two link cables from the SPARC M10-1 or SPARC M10-4/M10-4S, using the same procedure.**

Note - Record the positions of the link cables before removing them to ensure that they are reinstalled correctly.

11.4 Installing a Link Cable

This section describes the procedure for installing the link cables.

1. **Hold the link cable connectors, and connect the two link cables to the link board mounted in the PCI expansion unit.**

Note - Reinstall the link cables in their original positions by referring to the record you made before the start of maintenance.
Note - Confirm that the link cables are connected and firmly secured.

---

2. **Connect the two link cables to the link card mounted in the SPARC M10-1 or SPARC M10-4/M10-4S by using the same procedure.**

Note - Reinstall the link cables in their original positions by referring to the record that you made before the start of maintenance.
Note - Confirm that the link cables are connected and firmly secured.

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 12

Maintaining the Management Cable

This chapter describes the maintenance procedure for the management cable.

- Before Maintaining a Management Cable
- Configuration of the Management Cable Connection Port
- Removing the Management Cable
- Installing the Management Cable

12.1 Before Maintaining a Management Cable

This chapter describes only the configuration, removal work, and mounting work of a management cable.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the management cable, see "Management cable" in "Table 7-2 List of available maintenance types by FRU."

12.2 Configuration of the Management Cable Connection Port

This section describes the configuration and location of the management cable connection port.
The link cards of the SPARC M10-1 or SPARC M10-4/M10-4S are connected to the link board of the PCI expansion unit with the link cables and the management cable.

Figure 12-1 Location of management cable connection port

Location number	Component
1	Management cable (MGCBL)

12.3 Removing the Management Cable

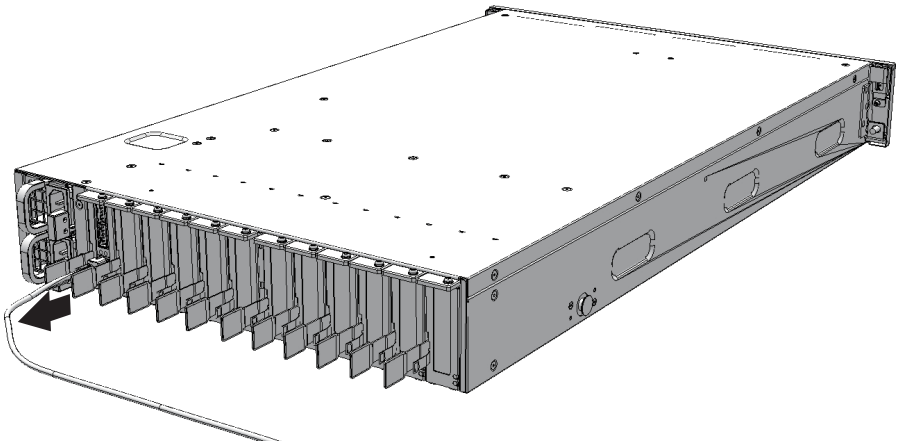
This section describes the procedure for removing the management cable.
Enable removal of the management cable before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

1. **Push the latch lock of the management cable on the PCI expansion unit, and then remove the management cable.**

Note - If you cannot not reach the latch lock of the connector, depress the latch with a flat head screwdriver and then remove the management cable. Do not use excessive force. Otherwise, the link board could be damaged.

Figure 12-2 Management cable removal



2. **Remove the management cable from the SPARC M10-1 or SPARC M10-4/M10-4S in the same way.**

12.4 Installing the Management Cable

This section describes the procedure for installing the management cable.

1. **Hold the connector of the management cable, and connect the management cable to the link board mounted on the PCI expansion unit.**

Note - Confirm that the management cable is securely connected.

---

2. **Connect the management cable to the link card mounted in the SPARC M10-1 or SPARC M10-4/M10-4S in the same way.**

Note - Confirm that the management cable is securely connected.

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 13

Maintaining the Power Supply Units

This chapter describes the procedure for maintaining power supply units mounted in a PCI expansion unit.

- Before Maintaining Power Supply Units
- Configuration of the Power Supply Units
- Removing a Power Supply Unit
- Installing a Power Supply Unit

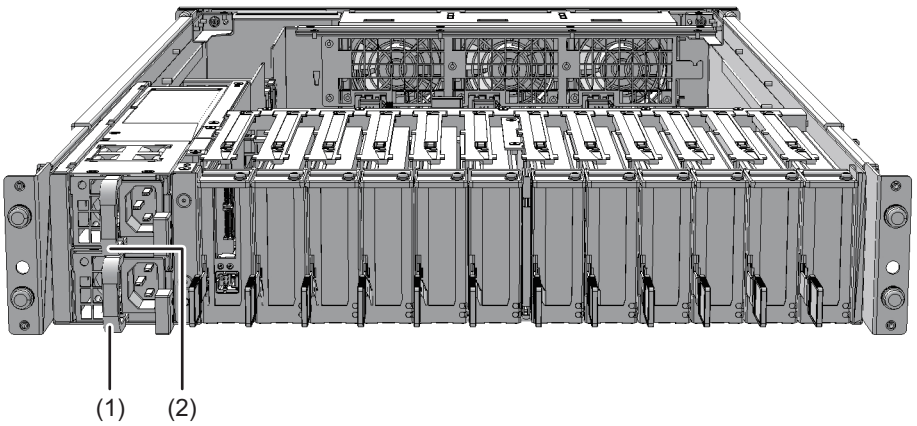
13.1 Before Maintaining Power Supply Units

This chapter describes only the configuration, removal work, and mounting work of power supply units.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the power supply unit, see "Power supply unit" in "Table 7-2 List of available maintenance types by FRU."

13.2 Configuration of the Power Supply Units

This section describes the configuration and the locations of the power supply units. The power supply units supply power to each component. To provide redundancy, two power supply units are mounted in the PCI expansion unit. If one power supply unit fails while the system is running, the 1+1 redundant configuration allows the system to continue operating.

Figure 13-1 Location of the power supply units



Location number	Component
1	Power supply unit (PSU#0)
2	Power supply unit (PSU#1)

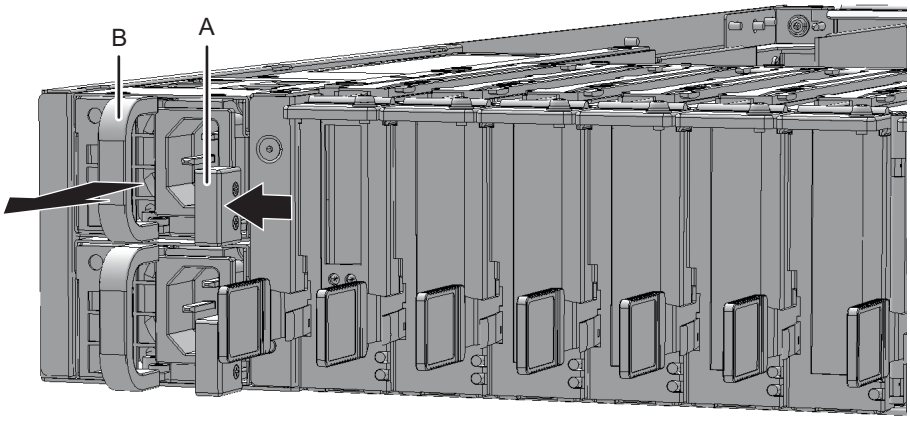
13.3 Removing a Power Supply Unit

This section describes the procedure for removing a power supply unit.
Enable the removal of the power supply unit before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

1. **Push the lever of the power supply unit requiring maintenance (A in the figure) in the direction of the arrow to release the lock, and then pull out the unit by grasping the handle (B in the figure).**

Figure 13-2 Removing a power supply unit



2. **Using your other hand, support the power supply unit from below and carefully remove it from the slot.**

Note - Place the removed power supply unit on a grounded antistatic ESD mat.

13.4 Installing a Power Supply Unit

This section describes the procedure for installing a power supply unit.

1. **With one hand, support the power supply unit from below and then carefully insert it into its slot.**

Note - Do not forcibly push the power supply unit into its slot. Using excessive force may damage the component or the chassis.

2. **Push the power supply unit fully home.**

Note - Make sure that the power supply unit is firmly inserted and fixed.

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 14

Maintaining the Fan Units

This chapter describes the procedure for maintaining fan units mounted in a PCI expansion unit.

- Before Maintaining Fan Units
- Configuration of the Fan Units
- Removing a Fan Unit
- Installing a Fan Unit

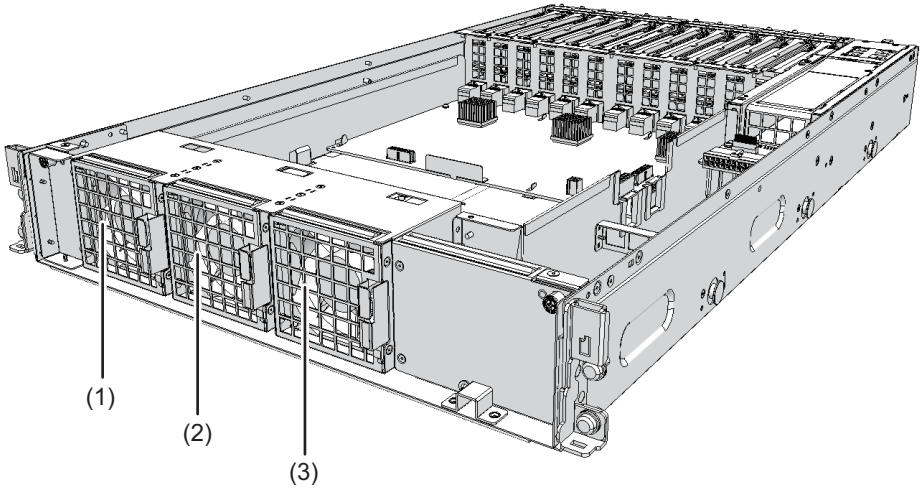
14.1 Before Maintaining Fan Units

This chapter describes only the configuration, removal work, and mounting work of fan units.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the fan unit, see "Fan unit" in "Table 7-2 List of available maintenance types by FRU."

14.2 Configuration of the Fan Units

This section describes the configuration and the locations of the fan units.
A PCI expansion unit has three fan units for cooling the components in the chassis. If one fan unit fails while the system is running, the 2+1 redundant configuration allows the system to continue operating.

Figure 14-1 Fan unit locations



Location number	Component
1	Fan unit (FAN#0)
2	Fan unit (FAN#1)
3	Fan unit (FAN#2)

14.3 Removing a Fan Unit

This section describes the procedure for removing a fan unit.
Enable the removal of the fan unit before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

14.3.1 Accessing a fan unit

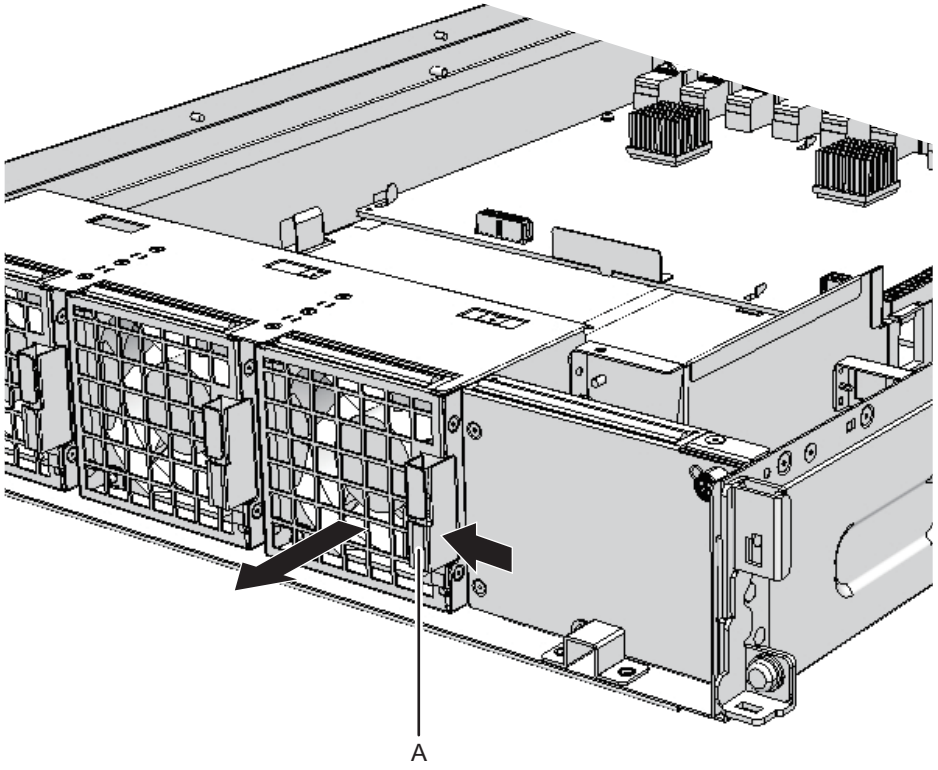
1. **Remove the front cover.**
   For details, see "5.7.3 Removing the front cover."

14.3.2 Removing a fan unit

1. **Press the handle (A in the figure) of the unit requiring maintenance to the left and then remove the fan unit from its slot.**

Note - Place the removed fan unit on the grounded ESD mat to ground any static electricity.

Figure 14-2 Fan unit removal



14.4 Installing a Fan Unit

This section describes the procedure for installing a fan unit.

14.4.1 Installing a fan unit

1. **Insert the fan unit into its slot.**

Note - Do not force the fan unit into the slot. Using excessive force may damage the component or the chassis.

---

2. **Firmly push the fan unit into its mounting location.**

Note - Confirm that the fan unit is inserted securely.

14.4.2 Restoring the chassis

1. **Install the front cover.**
   For details, see "6.1.1 Installing the front cover."

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 15

Maintaining the PCI Tray

This chapter describes the procedure for maintaining the PCI tray mounted in the PCI expansion unit.

- Before Maintaining the PCI Tray
- Configuration of the PCI Tray
- Removing the PCI Tray
- Installing the PCI tray

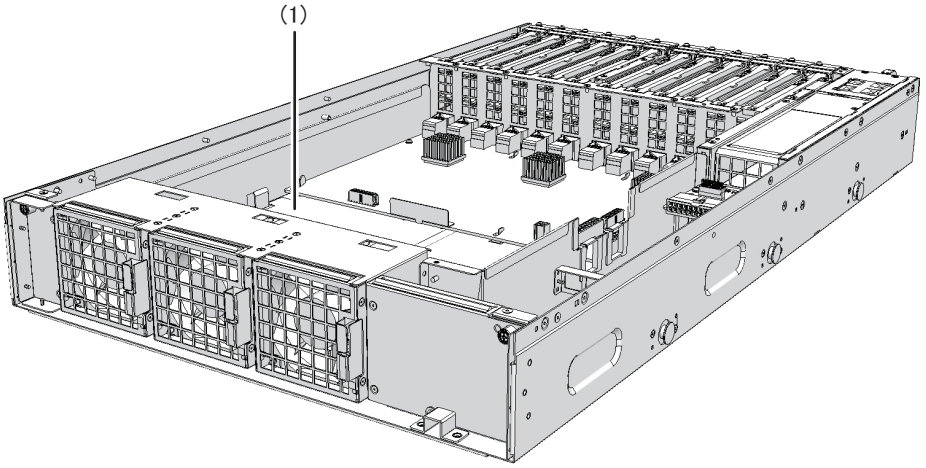
15.1 Before Maintaining the PCI Tray

This chapter describes only the configuration, removal work, and mounting work of a PCI tray.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the PCI tray, see "PCI tray" in "Table 7-2 List of available maintenance types by FRU."

15.2 Configuration of the PCI Tray

This section describes the configuration and location of the PCI tray.
The PSU backplane, I/O board, and fan backplane are mounted on the PCI tray.
When the PCI tray is to be replaced, replace the PCI tray and PSU backplane at the same time. The I/O board and the fan backplane must be reinstalled on the new PCI tray.

Figure 15-1 PCI tray location



Location number	Component
1	PCI tray (TRAY)

15.3 Removing the PCI Tray

This section describes the procedure for removing the PCI tray.
Enable the removal of the PCI tray before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

15.3.1 Accessing the PCI tray

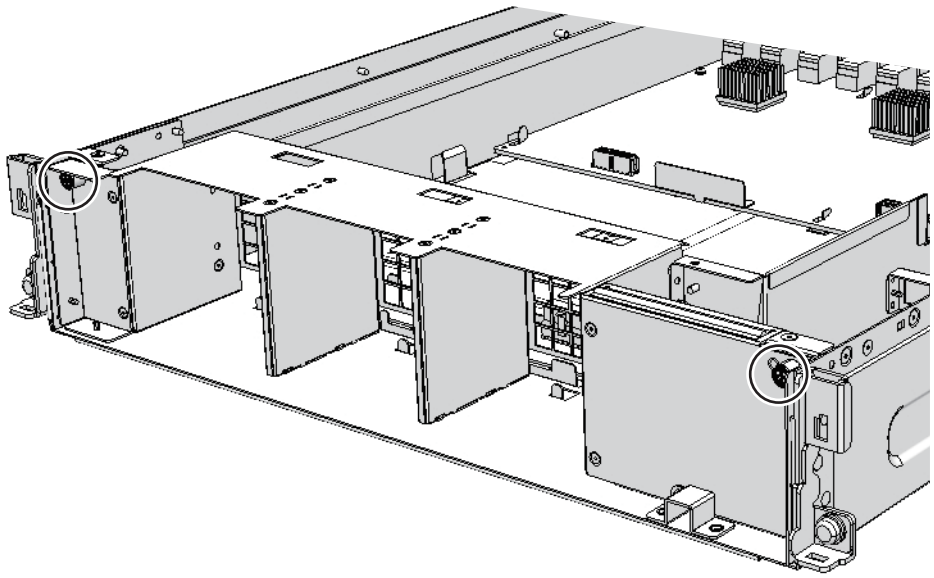
1. **Pull out the following components halfway.**
   - Power supply unit
     For details, see "13.3 Removing a Power Supply Unit."
   - PCI Express (PCIe) card cassette
     For details, see "8.3.2 Removing a PCI Express card cassette."

2. **Remove the front cover.**
   For details, see "5.7.3 Removing the front cover."
3. **Remove all the fan units.**
   For details, see "14.3.2 Removing a fan unit."

15.3.2 Removing the PCI tray

1. **Loosen the two screws securing the PCI tray and then slightly pull it out.**

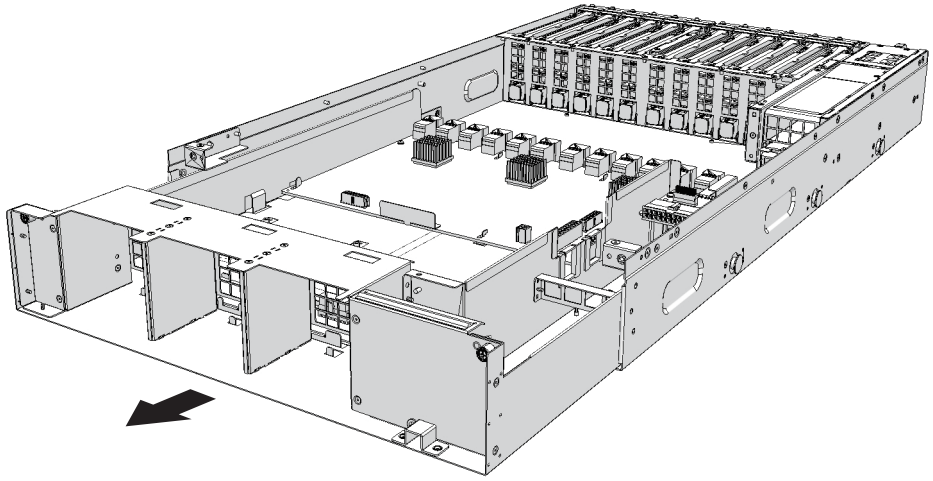
Figure 15-2 Screw for PCI tray



2. **Hold the PCI tray with both hands and carefully remove it from the chassis.**

Note - Place the removed PCI tray on the grounded ESD mat to ground any static electricity.

Figure 15-3 PCI tray removal



15.3.3 Removing the components of the PCI tray

1. **Remove the I/O board from the PCI tray.**
   For details, see "16.3.2 Removing the I/O board."
2. **Remove the fan backplane from the PCI tray.**
   For details, see "17.3.2 Removing the fan backplane."

15.4 Installing the PCI Tray

This section describes the procedure for installing the PCI tray.

15.4.1 Installing the components of the PCI tray

1. **Install the I/O board on the replaced PCI tray.**
   For details, see "16.4.1 Installing the I/O board."
2. **Install the fan backplane on the PCI tray.**
   For details, see "17.4.1 Installing the fan backplane."

15.4.2 Installing the PCI tray

1. **Hold the PCI tray with both hands and carefully insert it into the chassis.**

Caution - Confirm that the PCI tray is inserted and securely fixed.

---

2. **Tighten the two screws holding the PCI tray.**

15.4.3 Restoring the chassis

1. **Install all the fan units.**
   For details, see "14.4.1 Installing a fan unit."
2. **Install the front cover.**
   For details, see "6.1.1 Installing the front cover."
3. **Install all the components listed below.**
   - Power supply unit
     For details, see "13.4 Installing a Power Supply Unit."
   - PCIe card cassette
     For details, see "8.4.2 Installing a PCI Express card cassette."

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 16

Maintaining the I/O Board

This chapter describes the procedure for maintaining the I/O board mounted in the PCI expansion unit.

- Before Maintaining the I/O Board
- Configuration of the I/O Board
- Removing the I/O Board
- Installing the I/O board

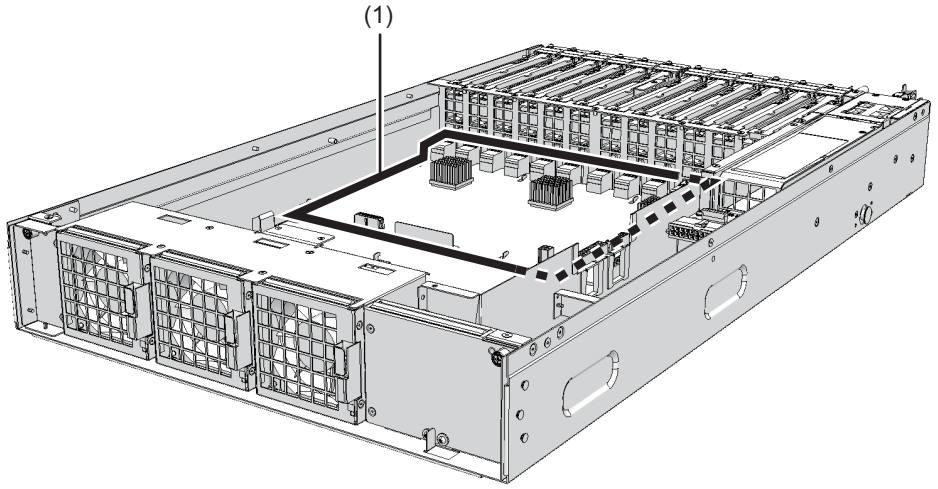
16.1 Before Maintaining the I/O Board

This chapter describes only the configuration, removal work, and mounting work of an I/O board.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the I/O board, see "I/O board" in "Table 7-2 List of available maintenance types by FRU."

16.2 Configuration of the I/O Board

This section describes the configuration and location of the I/O board.
Eleven PCI Express (PCIe) slots and one slot for the link board are provided on the I/O board.

Figure 16-1 Location of the I/O board



Location number	Component
1	I/O board (IOB)

16.3 Removing the I/O Board

This section describes the procedure for removing the I/O board.
Enable the removal of the I/O board before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

16.3.1 Accessing the I/O board

1. **Pull out the following components halfway.**
   - Power supply unit
     For details, see "13.3 Removing a Power Supply Unit."
   - PCIe card cassette
     For details, see "8.3.2 Removing a PCI Express card cassette."

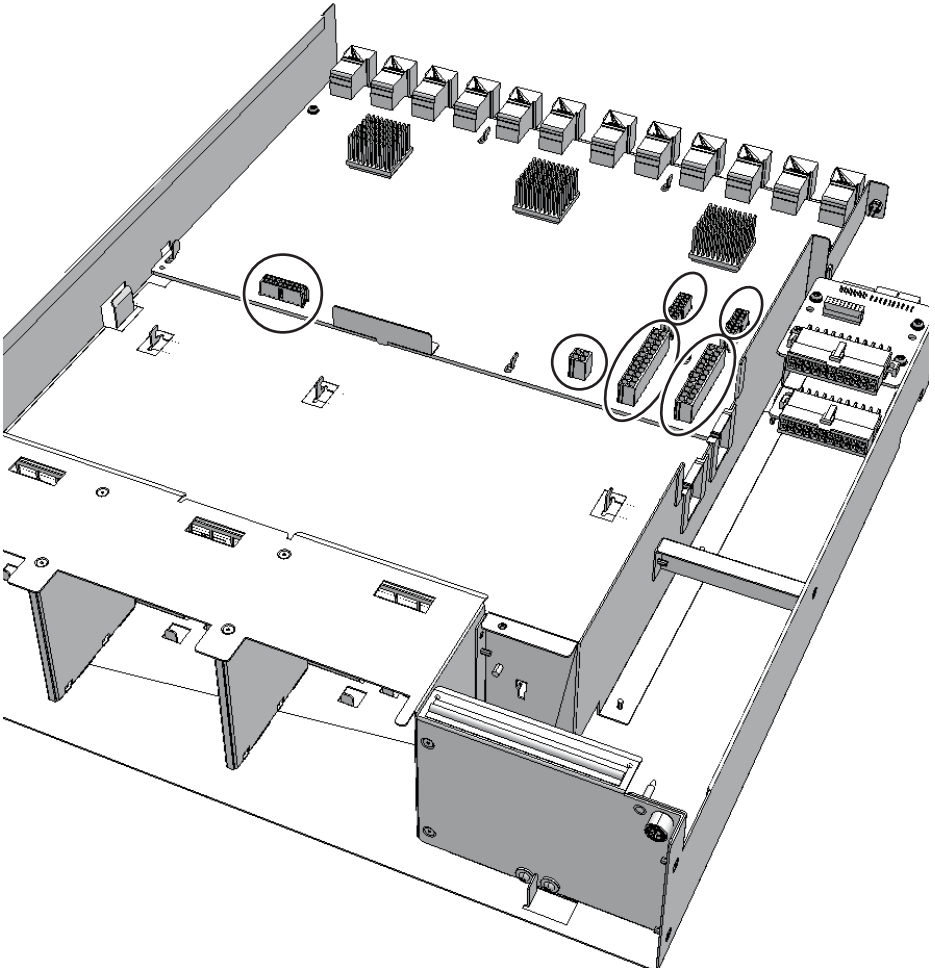
2. **Remove the front cover.**
   For details, see "5.7.3 Removing the front cover."
3. **Remove all the fan units.**
   For details, see "14.3.2 Removing a fan unit."
4. **Remove the PCI tray.**
   For details, see "15.3.2 Removing the PCI tray."

16.3.2 Removing the I/O board

1. **Remove the six cables connected to the I/O board.**

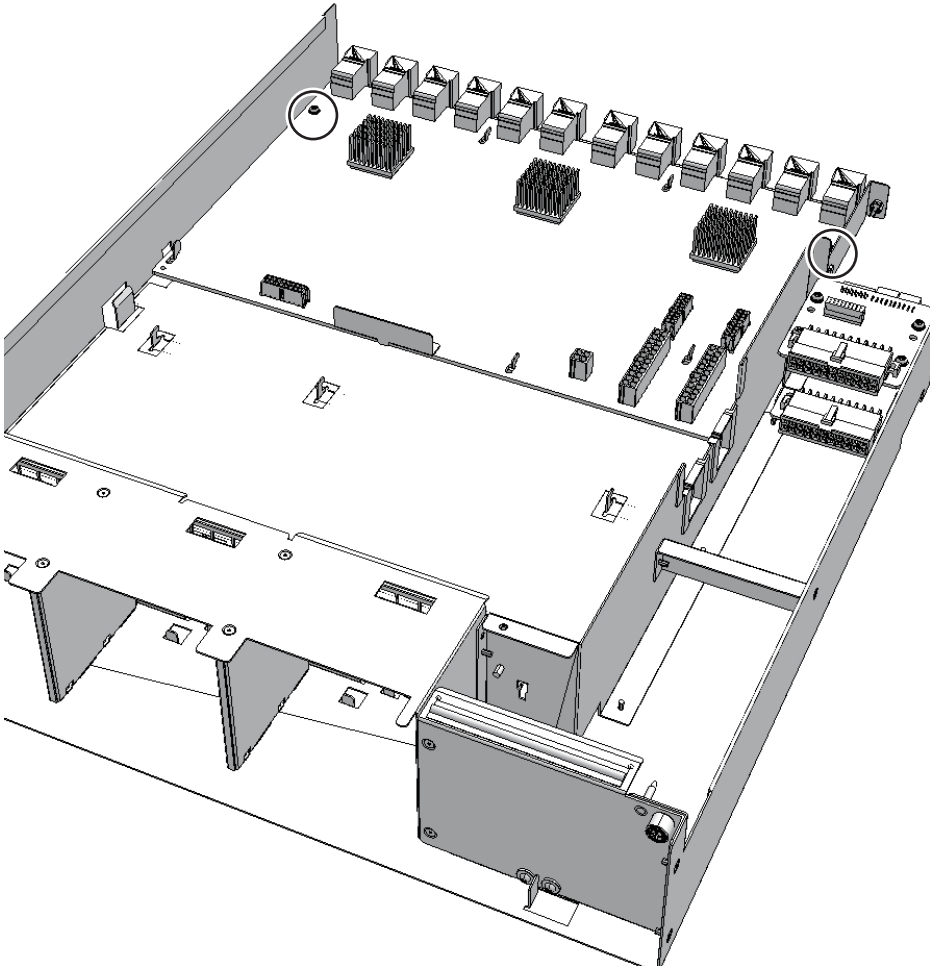
Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

Figure 16-2 I/O board cables



2. **Loosen the two screws securing the I/O board.**

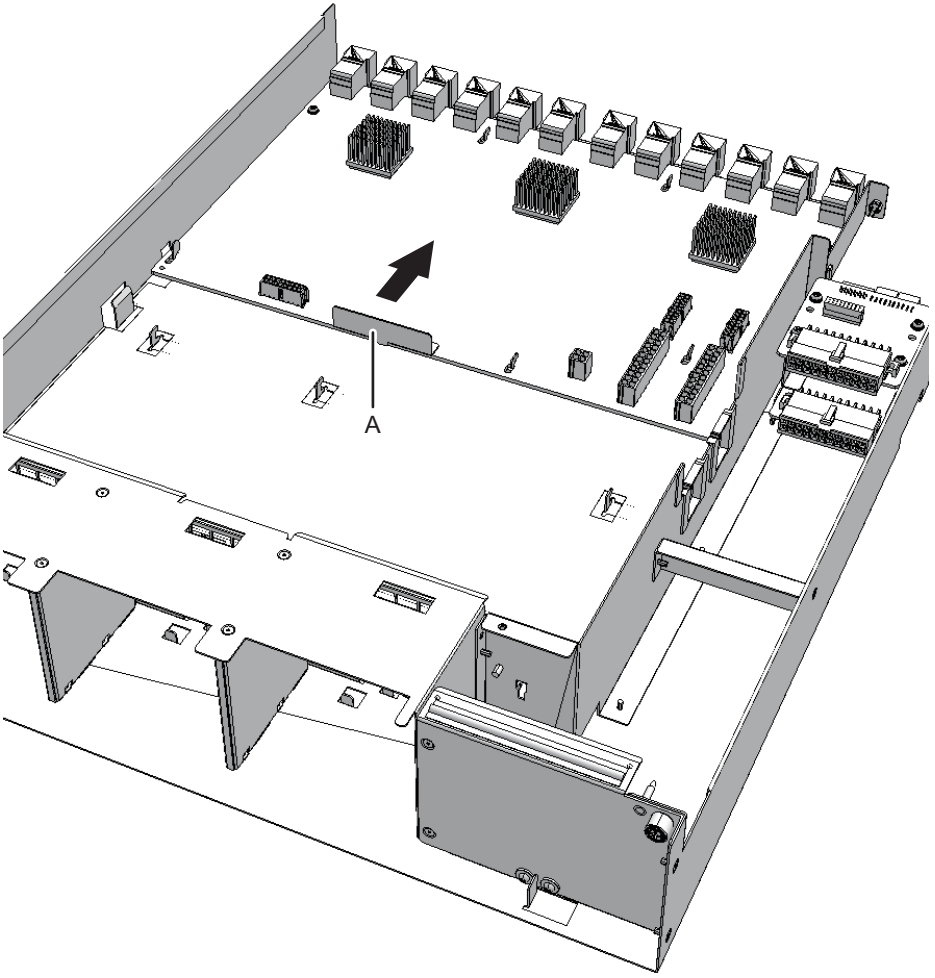
Figure 16-3 I/O board screws



3. **Hold and slide the guide (A in the figure) of the I/O board toward the rear of the chassis and then remove the board.**

Note - Do not remove the I/O board by holding its connectors.
Note - Place the removed I/O board on the grounded ESD mat to eliminate any static electricity.

Figure 16-4 I/O board removal



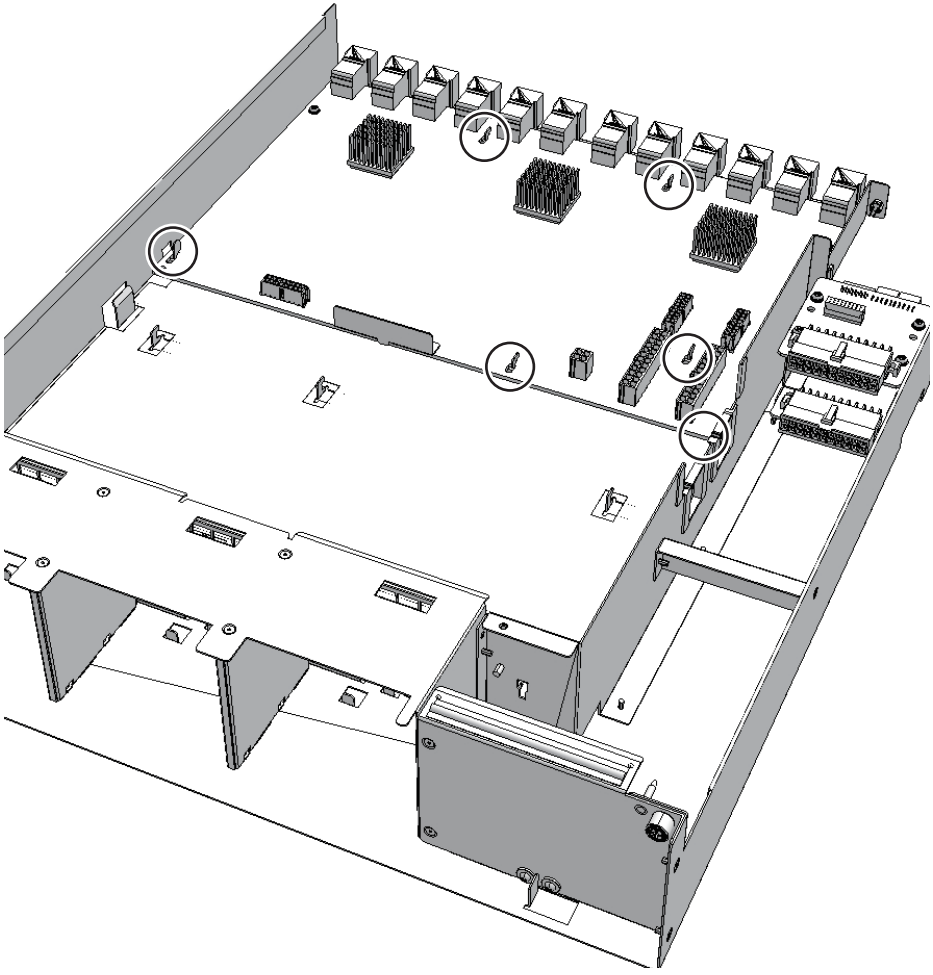
16.4 Installing the I/O Board

This section describes the procedure for installing the I/O board.

16.4.1 Installing the I/O board

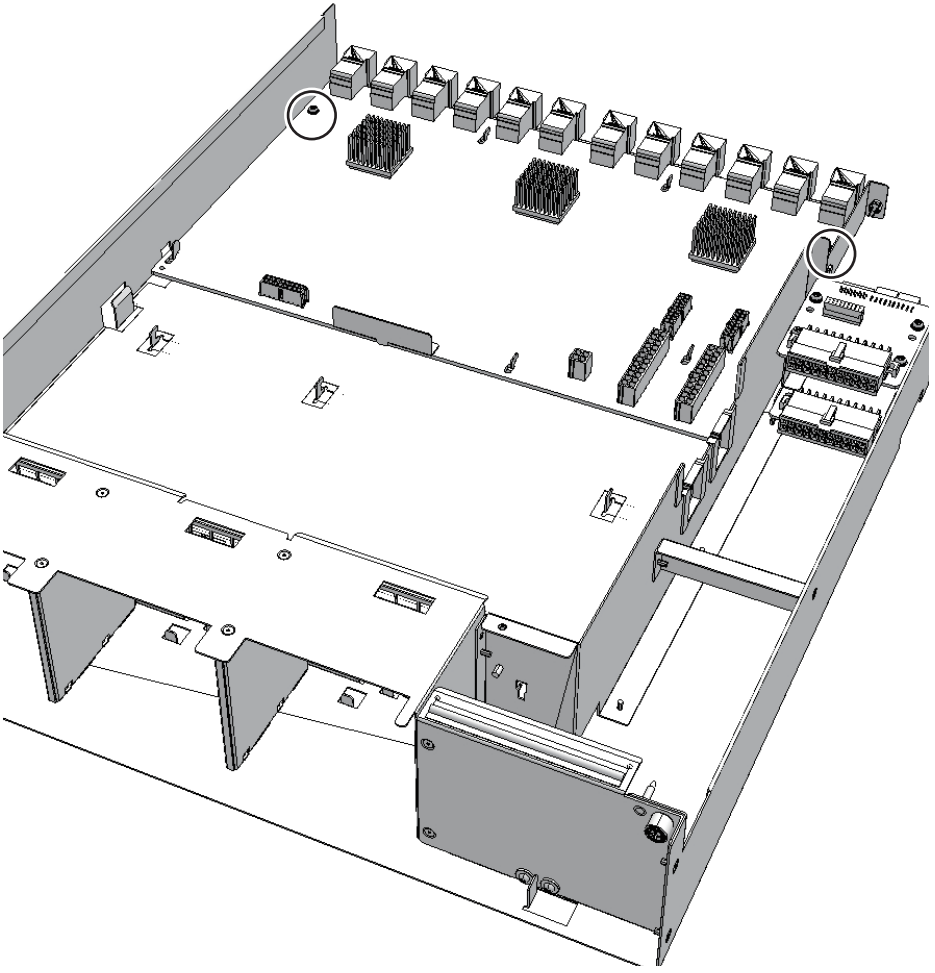
1. **Install the I/O board, adjusting it to align with the six stoppers. Hold and slide the guide to the front of the chassis.**

Figure 16-5 I/O board stoppers



2. **Tighten the two screws securing the I/O board.**

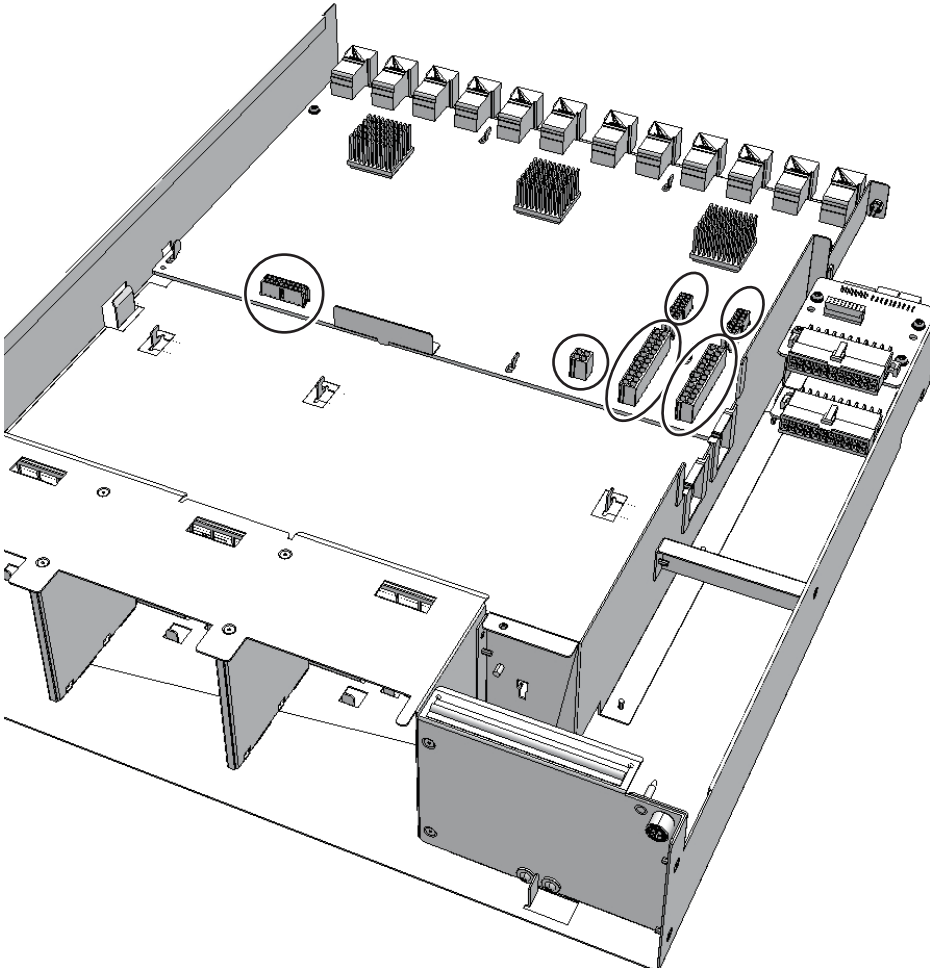
Figure 16-6 I/O board screws



3. **Connect all the six cables to the I/O board.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.

Figure 16-7 I/O board cables



16.4.2 Restoring the chassis

1. **Install the PCI tray.**
   For details, see "15.4.2 Installing the PCI tray."
2. **Install all the fan units.**
   For details, see "14.4.1 Installing a fan unit."
3. **Install the front cover.**
   For details, see "6.1.1 Installing the front cover."
4. **Install all the components listed below.**
   - Power supply unit
     For details, see "13.4 Installing a Power Supply Unit."

- PCIe card cassette
  For details, see "8.4.2 Installing a PCI Express card cassette."

Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Chapter 17

Maintaining the Fan Backplane

This chapter describes the procedure for maintaining the fan backplane mounted in the PCI expansion unit.

- Before Maintaining the Fan Backplane
- Location of the Fan Backplane
- Removing the Fan Backplane
- Installing the Fan Backplane

17.1 Before Maintaining the Fan Backplane

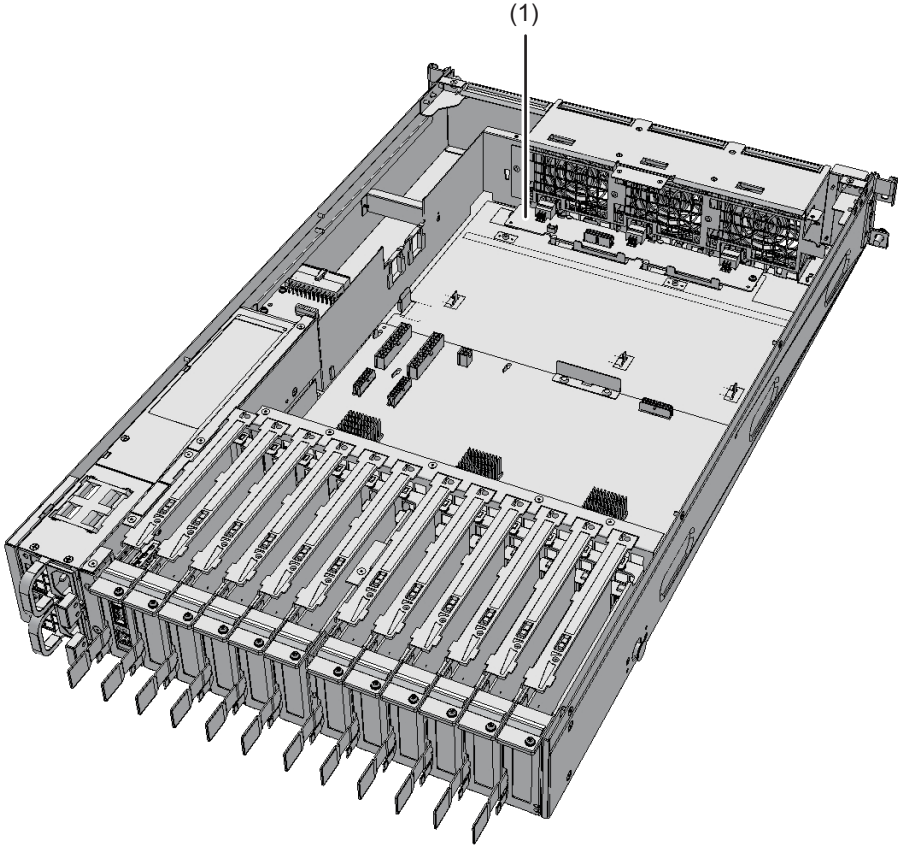
This chapter describes only the configuration, removal work, and mounting work of the fan backplane.
Before removal work of an FRU, perform necessary work items while referencing "Chapter 7 Maintenance Flow."
For maintenance types of the fan backplane, see "Fan backplane" in "Table 7-2 List of available maintenance types by FRU."

17.2 Location of the Fan Backplane

This section describes the location of the fan backplane.
The fan backplane connects the individual fan units.

Caution - Do not replace a fan backplane together with an I/O board. If you replace a fan backplane together with an I/O board, the PCI expansion unit serial number changes to all 0's ("0000000000"). If the serial number changes to all 0's ("0000000000"), you need to restore the original serial number by using the ioxadm command of the XSCF firmware.
To replace both a fan backplane and an I/O board, replace either of the two, start the physical partition connected to the PCI expansion unit, and check for error log information related to the PCI expansion unit. After confirming that no such error log information is displayed, replace the other Field Replaceable Unit (FRU).

Figure 17-1 Location of the fan backplane



Location number	Component
1	Fan backplane (FANBP)

17.3 Removing the Fan Backplane

This section describes the procedure for removing the fan backplane.
Enable the removal of the fan backplane before attempting to remove it. For details, see "Chapter 7 Maintenance Flow."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes Regarding Static Electricity."

17.3.1 Accessing the fan backplane

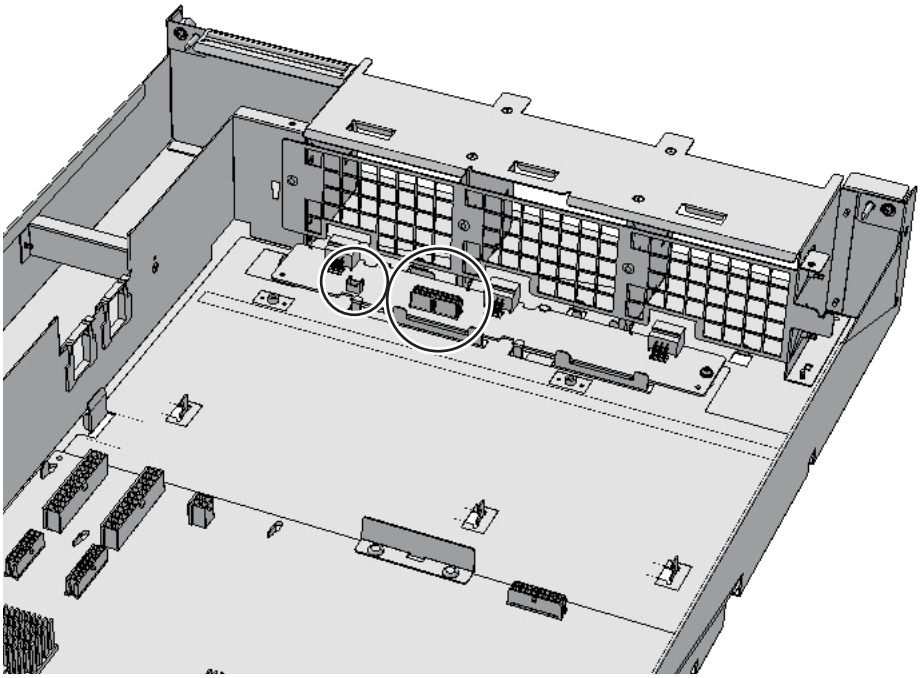
1. **Pull the following components out halfway.**
   - Power supply unit
     For details, see "13.3 Removing a Power Supply Unit."
   - PCI Express (PCIe) card cassette
     For details, see "8.3.2 Removing a PCI Express card cassette."
2. **Remove the front cover.**
   For details, see "5.7.3 Removing the front cover."
3. **Remove all the fan units.**
   For details, see "14.3.2 Removing a fan unit."
4. **Remove the PCI tray.**
   For details, see "15.3.2 Removing the PCI tray."

17.3.2 Removing the fan backplane

1. **Remove the two cables connected to the fan backplane.**

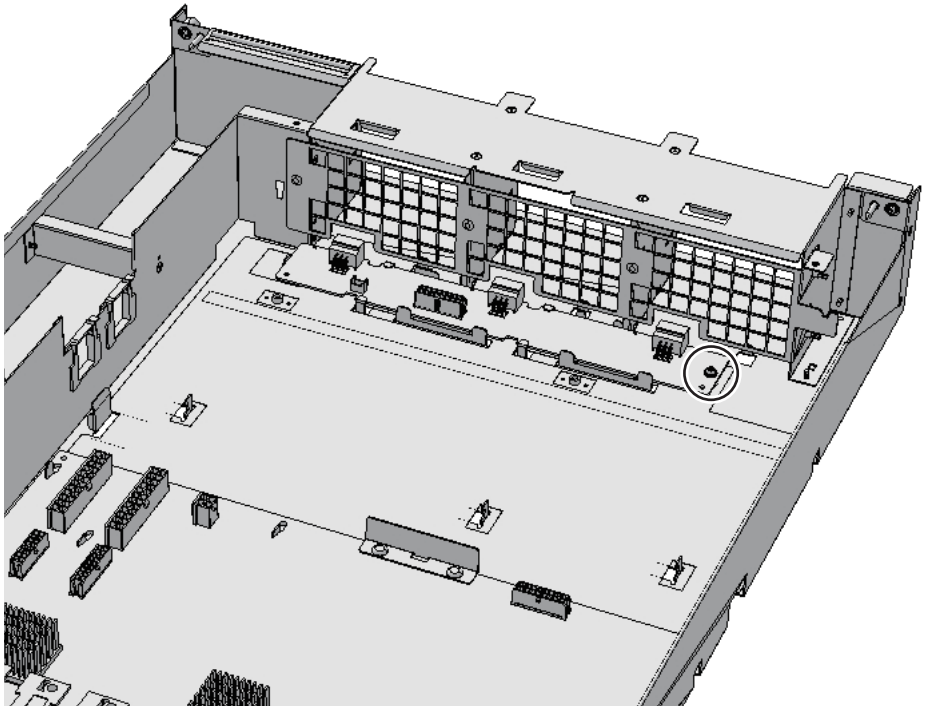
Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

Figure 17-2 Fan backplane cable



2. **Remove the screw securing the fan backplane.**

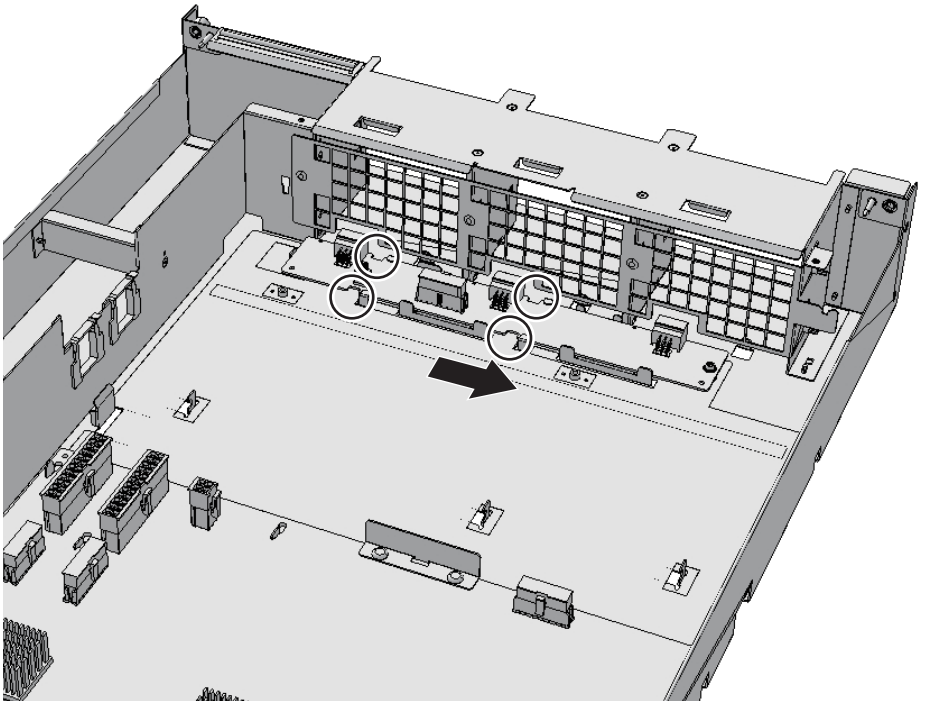
Figure 17-3 Fan backplane screw



3. **Slide the fan backplane in the direction of the arrow and align the groove of the fan backplane with the guides (four places) to remove it.**

Note - Do not remove the fan backplane by holding one of its connectors.
Note - Place the removed fan backplane on the grounded ESD mat to ground any static electricity.

Figure 17-4 Fan backplane removal



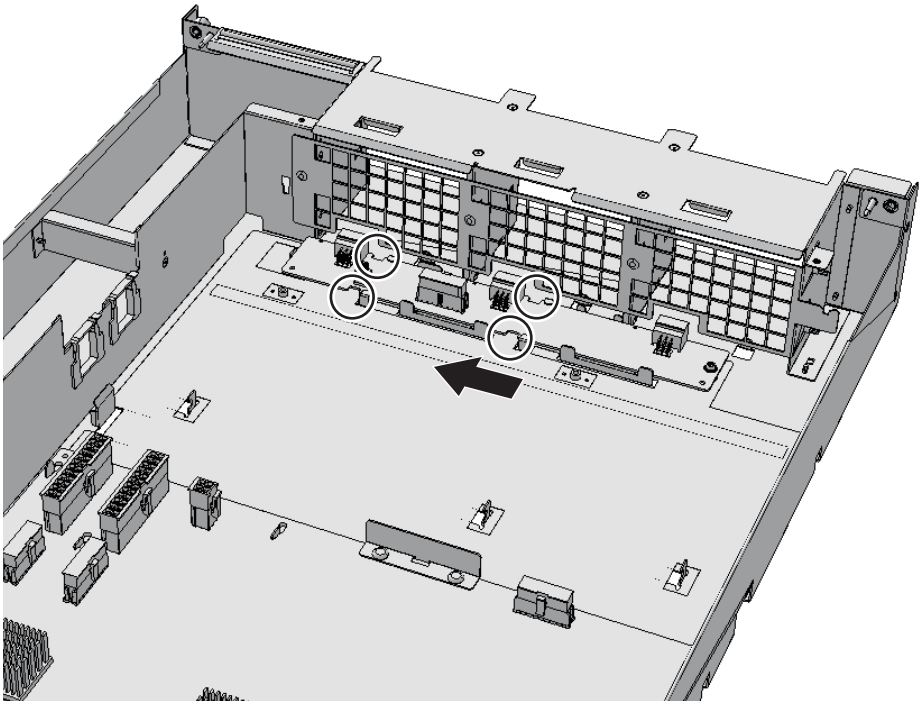
17.4 Installing the Fan Backplane

This section describes the procedure for installing the fan backplane.

17.4.1 Installing the fan backplane

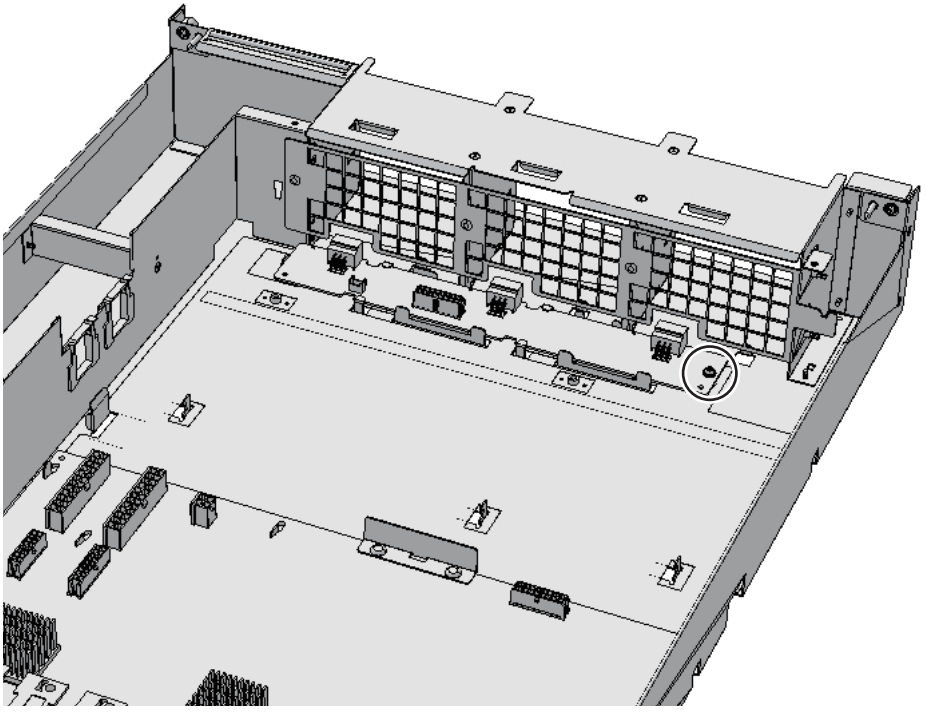
1. **Install the fan backplane by aligning it with the guides (four places) and then sliding it in the direction of the arrow.**

Figure 17-5 Fan backplane installation



2. **Secure the fan backplane with the screw.**

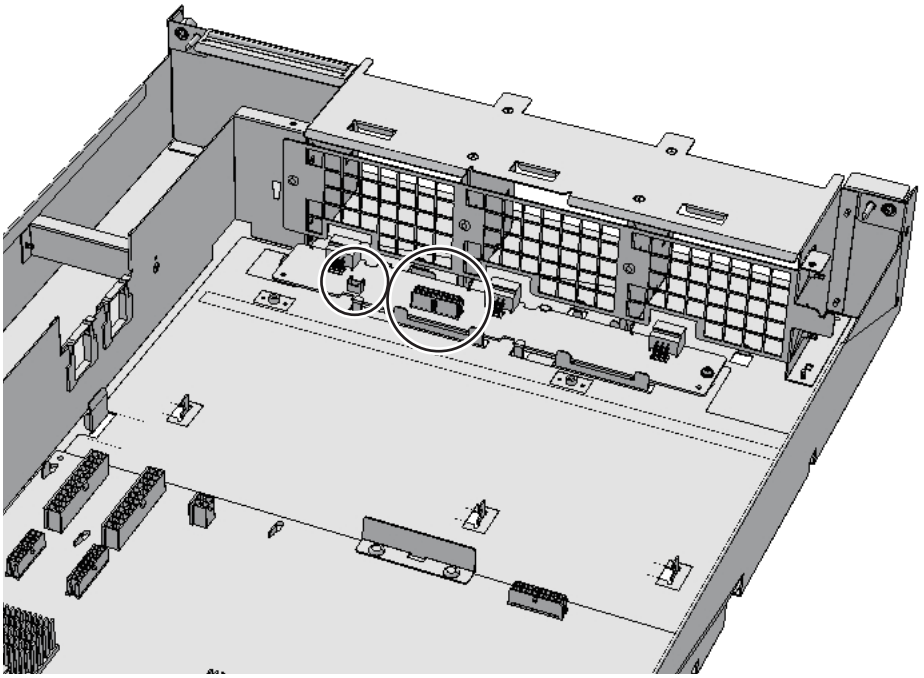
Figure 17-6 Fan backplane screw



3. **Connect the two cables to the fan backplane.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.

Figure 17-7 Fan backplane cable



17.4.2 Restoring the chassis

1. **Install the PCI tray.**
   For details, see "15.4.2 Installing the PCI tray."
2. **Install all the fan units.**
   For details, see "14.4.1 Installing a fan unit."
3. **Install the front cover.**
   For details, see "6.1.1 Installing the front cover."
4. **Install all the components listed below.**
   - Power supply unit
     For details, see "13.4 Installing a Power Supply Unit."
   - PCIe card cassette
     For details, see "8.4.2 Installing a PCI Express card cassette."

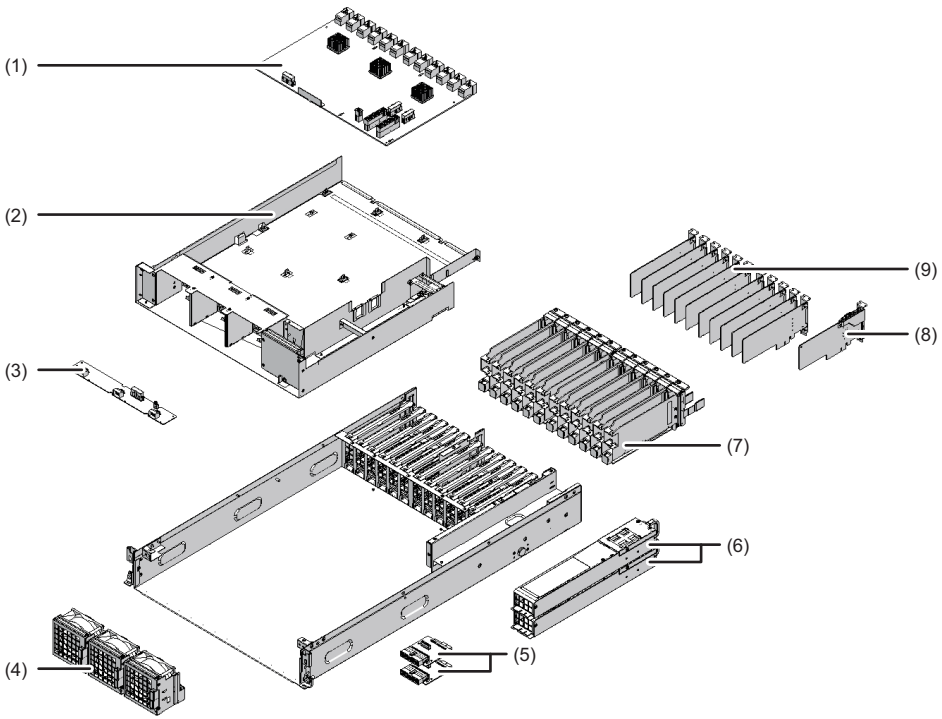
Now, the work for mounting the FRU is complete. While referencing "Chapter 7 Maintenance Flow," continue the maintenance work.

Appendix A

Component List

This appendix describes the components of the PCI expansion unit. Figure A-1 shows the locations of the components mounted in the chassis.

Figure A-1 Locations of components



Location number	Component
1	I/O board
2	PCI tray
3	Fan backplane
4	Fan unit
5	PSU backplane
6	Power supply unit
7	PCI Express card cassette
8	Link board
9	PCI Express card

Appendix B

Component Specifications

This appendix describes the specifications of the components.

- PCI Express Card
- Link Board
- Power Supply Unit
- Fan Unit
- PCI Tray
- I/O Board
- Fan Backplane

B.1 PCI Express Card

Up to eleven (11) PCIe cards can be mounted.
Table B-1 lists the specifications of the PCIe card.

Table B-1 Specifications of the PCIe card

Item	Description
Maximum number of PCIe cards	11
Location	Rear of chassis
Active/hot maintenance	Supported
Active/cold maintenance	Supported (with SPARC M10-4/M10-4S connected)
Inactive/hot maintenance	Supported
Inactive/cold maintenance	Supported
System-stopped maintenance	Supported

For the maintenance procedure, see "Chapter 8 Maintaining the PCI Express Cards."

B.2 Link Board

The link board is mounted in the slot that is dedicated to the link board for the PCIe card slot. The link board is connected to the link card mounted on the SPARC M10-1/M10-4/M10-4S through the link cable and the management cable.
Table B-2 lists the specifications of the link board.

Table B-2 Link board specifications

Item	Description
Number of link boards	1
Location	Rear of chassis
Active/hot maintenance	Supported (with SPARC M10-4/M10-4S connected)
Active/cold maintenance	Supported (with SPARC M10-4/M10-4S connected)
Inactive/hot maintenance	Supported
Inactive/cold maintenance	Supported
System-stopped maintenance	Supported

For the maintenance procedure, see "Chapter 9 Maintaining the Link Board."

B.3 Power Supply Unit

The power supply units take input power and supply it to the system. The redundant configuration of the power supply units allows the system to continue operating even if one of the units fails.
Table B-3 lists the specifications of the power supply units.

Table B-3 Power supply unit specifications

Item	Description
Number of power supply units	2
Redundancy	1+1 redundant configuration
Location	Rear of chassis
Active/hot maintenance	Supported
Active/cold maintenance	Supported (with SPARC M10-4/M10-4S connected)
Inactive/hot maintenance	Supported
Inactive/cold maintenance	Supported
System-stopped maintenance	Supported

For the maintenance procedure, see "Chapter 13 Maintaining the Power Supply Units."

B.4 Fan Unit

Three fan units are mounted in the chassis to create flow that forces air out of the chassis. The redundant configuration of the fan units allows the system to continue running even if a fan unit fails.
Table B-4 lists the specifications of the fan unit.

Table B-4 Specifications of fan units

Item	Description
Number of fan units	3
Redundancy	2+1 redundant configuration
Location	Front of chassis
Active/hot maintenance	Supported
Active/cold maintenance	Supported (with SPARC M10-4/M10-4S connected)
Inactive/hot maintenance	Supported
Inactive/cold maintenance	Supported
System-stopped maintenance	Supported

For the maintenance procedure, see "Chapter 14 Maintaining the Fan Units."

B.5 PCI Tray

The PSU backplane, I/O board, and fan backplane are mounted on the PCI tray. When the PCI tray is to be replaced, replace the PCI tray and PSU backplane at the same time. Remount the I/O board and fan backplane on the replaced PCI tray.
Table B-5 lists the specifications of the PCI tray.

Table B-5 PCI tray specifications

Item	Description
Number of PCI trays	1
Location	Inside the chassis
Active/hot maintenance	Unsupported
Active/cold maintenance	Supported (with SPARC M10-4/M10-4S connected)
Inactive/hot maintenance	Unsupported

Table B-5 PCI tray specifications *(continued)*

Item	Description
Inactive/cold maintenance	Supported
System-stopped maintenance	Supported

For the maintenance procedure, see "Chapter 15 Maintaining the PCI Tray."

B.6 I/O Board

Eleven PCIe slots and one slot for the link board are provided on the I/O board. Table B-6 lists the specifications of the I/O board.

Table B-6 I/O board specifications

Item	Description
Number of I/O boards	1
Location	Rear of chassis
Active/hot maintenance	Unsupported
Active/cold maintenance	Supported (with SPARC M10-4/M10-4S connected)
Inactive/hot maintenance	Unsupported
Inactive/cold maintenance	Supported
System-stopped maintenance	Supported

For the maintenance procedure, see "Chapter 16 Maintaining the I/O Board."

B.7 Fan Backplane

The fan backplane connects the three fan units. Table B-7 lists the specifications of the fan backplane.

Table B-7 Fan backplane specifications

Item	Description
Number of fan backplanes	1
Location	Inside the chassis
Active/hot maintenance	Unsupported
Active/cold maintenance	Supported (with SPARC M10-4/M10-4S connected)

Table B-7 Fan backplane specifications *(continued)*

Item	Description
Inactive/hot maintenance	Unsupported
Inactive/cold maintenance	Supported
System-stopped maintenance	Supported

For the maintenance procedure, see "Chapter 17 Maintaining the Fan Backplane."

Appendix C

Problems during Firmware Update

This section explains the problems that may occur during firmware update.
The following errors may occur:

- A hang up occurs in the XSCF while the firmware is being updated.
  Action: Update the firmware again.
- A hang up occurs in the PCI expansion unit while the firmware is being updated.
  Action: Either the link card or the I/O board has a failure. Replace the failed part.
- An error message related to a write failure "FROM write error" appears.
  If an error occurs during firmware update, operation continues using the previous version of the firmware.

  Action: Update the firmware again. The firmware update may be completed successfully. If an error occurs again during the firmware update, the I/O board has a failure. Replace the failed part.

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